

MOTOR AGE

VOL. X NO. 10

CHICAGO, SEPTEMBER 6, 1906

\$2.00 Per Year

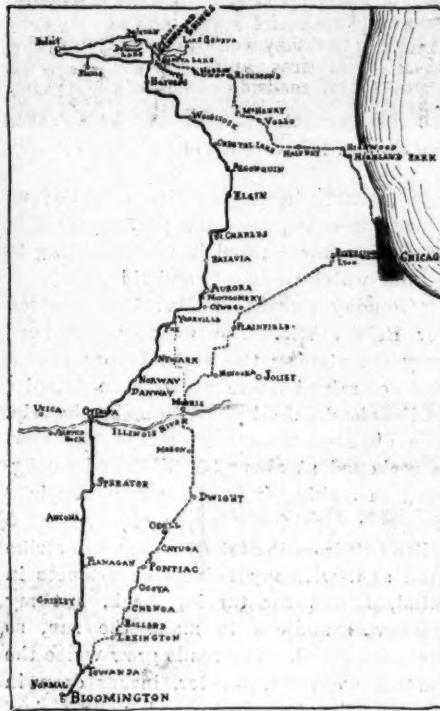
AN UNINTENTIONAL ENDURANCE TEST



THE PARTY

TO TAKE an automobile trip which is full of interest to those immediately concerned is one thing; to tell of that trip in a manner which will interest strangers is another. Especially is this true when the entire tour is practically barren of those experiences which are of value as "lessons of the road" to those who follow after. In these days, when extended automobile tours are of common occurrence, there must be something unusual connected with a particular ride which will make the story thereof of interest to third persons. This element in this particular trip is perhaps supplied by the fact that the car was a new one which had been purchased only a week before the party started, which fact makes its performance somewhat remarkable.

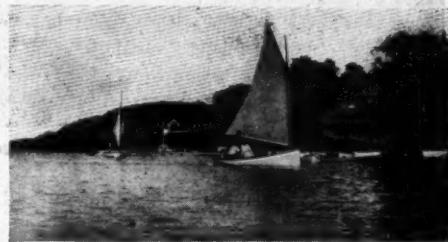
S. P. Irwin and wife and four children, Alta, Doris, Marjorie and Philip, their respective ages running from 12 to 7, had been for several years talking of a trip from their home in Bloomington, Ill., to their cottage at Geneva Lake. Finally when the new car was purchased the trip was arranged. The morning was gray and cloudy. Rain in Illinois is a serious matter to the automobilist and the Irwins were anxious to reach the gravel roads to the north as soon as possible. The route chosen was from Bloomington to Towanda, following the right of way of the Chicago & Alton railway to that point. At To-



THE ROUTE

wanda they left the main traveled road which is followed by St. Louis-Chicago tourists, and went almost directly north. Gridley, 19 miles from home, was passed at 8:05 and at 9 o'clock the party stopped a few minutes at the house of a friend in Flanagan, 12 miles farther on.

"From Flanagan to Streator is 20 miles and this we covered in about an hour," says Mr. Irwin in telling of the trip. "Up to this time we had traveled over dirt roads entirely, but they were in fairly good condition and we congratulated ourselves on the time made. About half-past 9 the sun came out and this, with the fact that from Streator on we would have gravel roads almost the entire distance to Wisconsin, dispelled our fears of rain. We stopped in Streator at 10:15, 51 miles from home, resuming our journey half an hour later, again running due north to Ottawa. The road from Streator to Ottawa, 16 miles, was in splendid condition, gravel in the middle and good dirt roads on either side. At Ottawa we crossed the historic



THE DESTINATION

Illinois river after descending a steep hill, and pulled up at the garage of W. H. Knowles at 11:45, having traveled about 67 miles. Most of the road between Ottawa and Aurora, 49 miles, is gravel, but is hilly as one gets into the Fox river country. Following our schedule we passed through Danway, Norway and Newark without incident but got off the road between Newark and Fox, coming out at Millbrook, having to take another road to Fox. At Yorkville we struck familiar ground as we had gone from Yorkville to Aurora in August when making the interstate tour to Chicago. It was county fair day at Yorkville and we passed a good many teams between Yorkville and Aurora returning from the fair. From Yorkville the road angles to the northeast, leaving Oswego to the right and crossing the Fox river again at Montgomery on an enclosed bridge the sides of which are open and through which a beautiful view of the river is afforded. We reached Aurora, 114 miles from our starting point, at 4:40.

"We left Aurora at 5:40 for Elgin, passing through Batavia, Geneva and St. Charles. This one ride is worth traveling a long way to take as the road follows the Fox river and abounds in beautiful views. We took our time and enjoyed the panorama spread before us, reaching Elgin, 22 miles from Aurora, at 7 o'clock. We lit our lamps just before reaching Elgin and stayed in that city only long enough to purchase some tea, a tin cup and a small tin bucket. A few miles north of Elgin we stopped at a school house and built a small camp fire at the side of the road, made tea and had our supper. As yet we had made no definite decision as to where we would stop for the night, but



AURORA CANON AT STARVED ROCK ON THE ILLINOIS RIVER

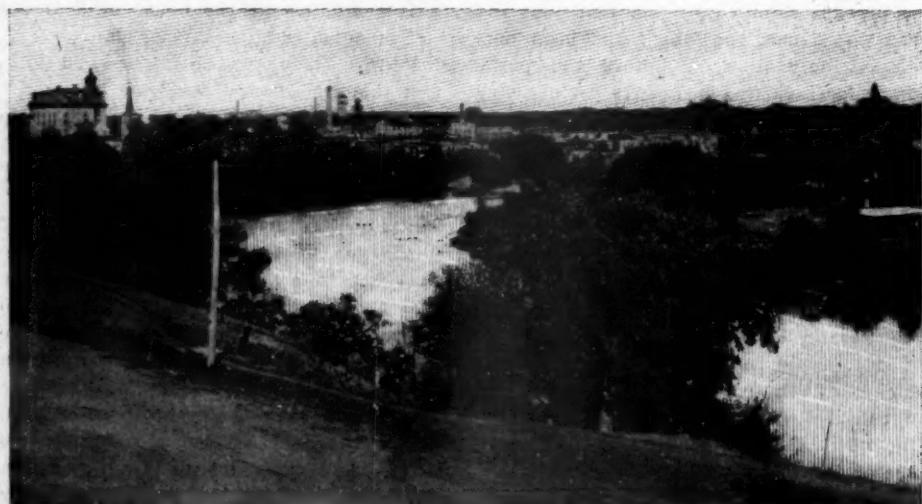
had thought of Dundee. The moon had come up and some passing farm hands gave us road directions to Dundee, but warned us against attempting the road from Dundee to Algonquin on account of the steep hills and stony roads. It was 9 o'clock when we finished our supper and the air was growing chilly, so we took the blankets from the suitcase and tucked the children snugly in the tonneau before we started on. We had gone several miles without seeing any sign of Dundee when we came to the first signboard we had encountered on our trip. According to it, Algonquin lay $2\frac{1}{2}$ miles to our left, so we headed for Algonquin, again finding a steep hill to go down and crossing the Fox river for the sixth time. Everyone but the night watchman had gone to bed in Algonquin. The moon, the river, the hills and sleeping town made a beautiful picture as we passed through. My wife and the children were for going on and I was in the same mood, so we followed the signboards and headed for Crystal Lake station. We kept on past Crystal Lake and went on to Woodstock, which we reached about 10:30. We stopped in Woodstock only long enough to inquire the road and distance to Harvard. The distance was 15 miles, the road direction 'Follow your nose.' I followed it and although at times I thought it had led me astray—clouds had obscured our compass, the north star, and the moon did not seem to be in the right place—we finally sighted the lights of Harvard and passed there at 11:45. From Harvard to our cottage at Geneva Lake is only 11 miles and the road is familiar to me, but we now ran into heavy fog which made it dangerous to attempt fast running. It was just 30 minutes past midnight when we stopped at the cottage and unloaded. We had covered about 210 miles since we left home with only about 5 or 6 hours'

rest at odd times. No tire troubles; no engine troubles, save the putting in of a gasket at Aurora, and in fact 'nothing to do but watch the road' and ride.

"Sunday morning at 10:45 we started for Beloit, Wis. The weather had been very threatening the night before but it had not rained where we were, so, in spite of the clouds, we decided to make the trip. The distance from our cottage to Beloit is reckoned at about 35 miles and we figured on making it in a leisurely way in 2 hours. Alas for our plans! About 5 miles out from the lake we began to strike mud and, with my Illinois experiences in mind, I was for turning back, but my wife was anxious to make the run, so we went ahead. The roads grew worse the further we went. Water, inches deep in places, filled the road; sand, yellow clay, loose gravel and dirt dumped into the middle of the road by the road improvers, and, in places, what seemed to be nothing but loose stones. Our course was due west, but at a small school house which had been doing duty as a place of public

worship that day we chose what seemed to be the better road and turned south only to find, when we had gone about 3 miles, that we would have to go back to the school house. It was at a small town called Blaine that we discovered our mistake but the depressing information that we must go back was accompanied by the somewhat cheering assertion that we would find gravel roads a few miles further west. Where those gravel roads were on that particular Sunday I do not know, but I do know they were not in the locality through which we traveled. About 2 miles from the school house a small boy gave us the cheering information that it was only 9 miles to Beloit. The edge of our joy was somewhat dulled a mile further on when some men standing in a farm yard told us we were still 9 miles from Beloit and when, a mile or so further on, another man made the averment that it was 9 miles to Beloit I suggested to my wife that Beloit was evidently expecting us and trying to escape.

"The road we were following wound around in queer fashion and when we finally sighted the domes and spires of the city of our search we were far to the south, whereas we should have come in from the east. A mile from the city we found the roads dry and in excellent shape; the shower which the night before had drenched the country for a strip of 20 miles in width had not touched Beloit. We drew up at a promising restaurant at 1:45, the machine and ourselves spattered all over with mud and water. Beloit was familiar ground to us and we drove around the beautiful city for some time. We had decided, irrevocably, not to return by the road we had come, and at 3:30 we left Beloit on the return trip to Geneva Lake by way of Delavan and Delavan lake. The first 4 or 5 miles the roads were good, but after that we struck the rain belt again and found bad going, but nothing to compare with our morning's experience and after we passed Darien, some 15 miles from Beloit, the roads were dry again. We passed through Delavan at 5 o'clock, be-



GLIMPSE OF BELOIT, WIS., AND THE BEAUTIFUL ROCK RIVER

ing careful to heed the 8-miles-an-hour notice posted at the edge of town. It lacked 10 minutes of 6 o'clock and was not yet dark when we reached the cottage, having covered about 75 miles in all, fully 40 of which was over roads which looked to me impassable as they stretched away in front of me. I ran the car down to the beach Monday morning and gave it a good washing, but the mud stains on the body still show in spots and I suppose will remain there as a constant reminder to me of one of the toughest trips I have ever taken in an automobile.

"In Illinois most of the work upon the country roads is done in May, while the ground is soft and easily worked. In Wisconsin the heavy rains of the summer play havoc with the hilly roads, so, when harvest is over, the time for 'road improvement' begins. Teams and hand scrapers are called into requisition and gravel is hauled in wagon loads and dumped in the road to be worn down by passing traffic. Travel over these improved roads in an automobile is not only unpleasant but dangerous, and finding that the roads over which we had already traveled in Wisconsin were in this condition we abandoned our idea of visiting Madison and Baraboo and determined to return home by way of Chicago. The route selected was through Hebron, Richmond, McHenry, Vollo, Wauconda and Half-Day to Highland Park and from there along the famous Sheridan road to the city. We fixed upon Thursday morning as the time to start. The lunch basket and suitcase were packed the night before, as far as possible, so that we were ready, after an early breakfast, to start at 6 o'clock. The signboards in southern Wisconsin and northern Illinois were of great assistance to us, as long as they lasted, and enabled us to find our way to Hebron and Richmond without trouble. We passed through Richmond at 7 o'clock and took the road on the east side of the Northwestern tracks to McHenry. I have a settled conviction that the west road is better, for it is scarcely possible that it could be as bad as the east road. We came into the east side of McHenry, which seems to be divided into three sections, east, central and west, and here we turned east across the ever-present Fox river toward Vollo. We had been directed to follow the telegraph poles and this we did faithfully. They led us east, southeast and after we had passed Vollo almost entirely south. After running what seemed to us a long way we stopped at a crossroad to inquire directions. The German woman to whom our questions were directed was extremely cloudy on all points save one; if we continued in the direction we were going for

12 miles we would come to Arlington Heights. This would carry us too far south, so we again headed east and about a mile further met a man who told us to keep straight on and we would come to Prairie View and Half-Day. This was reassuring to us, as it was then evident we had not gone far out of our way, and we soon came to Prairie View and about a mile further on reached Half-Day. Due east from Half-Day about 7 miles brought us out at Highwood and turning south on the macadam road just west of the Northwestern tracks we were soon in Highland Park, where we crossed the railroad track and came to Sheridan road. It was a quarter past 10 when we reached Highland Park. We sneaked through Evanston at a snail's pace, and climbed Hubbard hill near Winnetka. Just south of Edgewater, after

leads out of the west side of Chicago to Riverside. At Riverside we crossed the railroad tracks and went south about a mile to Lyons; here the road runs west about a mile and then bears away to the southwest to Plainfield, 42 miles from Chicago. This is a good gravel road and is kept in fairly good condition. After leaving Lyons the road does not pass through a single town until Plainfield is reached. It began to sprinkle a little about half-past 5 and we about made up our minds to stop at Plainfield over night, as we would have dirt roads almost entirely after leaving Plainfield. We reached the latter place at 6:35 but as the weather showed some signs of clearing, we lit our lamps and set out toward Morris, 27 miles further on. From Plainfield we went south about a mile and a half to the tile factory, where

we turned west and crossed the railroad and the DuPage river. We had taken this road from Chicago to Bloomington the month before and felt fairly sure of our landmarks. A mile west of the railroad we again turned south for about 4 miles, then west again across the same railroad at a settlement called Caton farm to a school house about 3 miles west of the railroad. Here we stopped 20 minutes for lunch. From the school house the road runs due south about 9 miles, mostly gravel, and intersects the road from Joliet to Morris, half a mile west of the town of Minooka. From Minooka to Morris the road is winding until about a mile and a half north of Morris, where it comes out on the straight north and south road leading from Morris to Yorkville. We reached Morris at 9 o'clock. We crossed the Illinois river and the Illinois & Michigan canal at Morris, leaving there at 9:25. From Morris to Dwight is 22 miles, due south, with only one town, Mazon, between. For about $3\frac{1}{2}$ miles



FRENCH CANON, STARVED ROCK

we had detoured a couple of blocks where the steam roller was at work on Sheridan road, I found that I had a punctured tire. This was the only puncture I had on the trip, but I thought it came at a very inopportune time, as it was only 25 minutes until noon and we had planned to picnic at Lincoln park. As there was no help for it, however, my wife and the children took the lunch basket over to the shore of Lake Michigan, only a few rods distant, and ate their lunch while I fixed the tire.

"It was nearly 2 o'clock when we stopped on automobile row in Chicago, about 105 miles from our starting point of the morning. After a hot dinner I oiled the engine and put in some gasoline and at 10 minutes past 4 we left the corner of State street and Jackson boulevard for the final 150 miles of our journey. We chose the Plainfield route to Bloomington which

south of Morris the road is gravel, but from there on to Bloomington, with the exception of about 4 miles, there is nothing but dirt road. We passed through the east side of Mazon and noted with painful memories the spot where a month before we had been hung up for 2 hours in the noontide heat of a red-hot day with an exploded tire. It was 10:50 when we reached Dwight and after hot coffee we were again on the move. We left Dwight at 11:05 and reached Pontiac, 20 miles further on, at 12:20. It was 25 minutes after 3 in the morning when we reached home. I was too tired to sleep well and was up by half-past 7 and went at once to inspect the car. The engine started at the first turn and after being cleaned up was ready for the next run of its remarkable career. But, as Kipling says, 'that's another story.'"

FAST TIME MADE IN BEACH MEET

Despite Heavy Course, at Atlantic City, Big Cars Show Great Speed—Hemery Darracq Does Miles in :39 3-5—Cooper Matheson Beats English Daimler

Atlantic City, N. J., Sept. 3—Neptune, when he retired with the receding tide, left as beautifully smooth and hard a beach for the opening races of the Atlantic City Automobile Club meet today as speedsters could ask, but Jupiter Pluvius, in a fit of jealousy, spoiled it all by sending forth at the hour set for the curtain-raising a veritable cloudburst, which softened the course and drenched the spectators, sending many of them scurrying for home. In a quarter of an hour, though, good-natured old Sol beamed forth brightly and dried the women's wet finery and the men's clothes in wrinkles on their—*i. e.*, the latter's, of course,—backs, arms and legs. The course, though, was ruined and fast going was utterly out of the question. The time scored in the face of this in the record trials which opened the programme was really remarkable. Until Walter Christie lowered the figures to 35 seconds the record of the beach was 38 seconds, yet that grand old veteran Hemery Darracq, which won the Vanderbilt and Havana cups, reeled off a mile over the soft, wet sand in 39½ seconds. You remember what a hurricane Willie K. Vanderbilt's 39 seconds at Ormond, less than 3 years ago, created? The other 80-horsepower Darracq, owned by Charley Schroeder, a pal of Arthur Zimmerman's down Manasquan way, which once held the Ventnor beach record of 38 seconds, did 40½ seconds. The 24-horsepower Fiat Junior made a run in 51½ seconds, a new middleweight record for the beach, and Howard Sell's Stanley steamer showed a mile in 51½ seconds. With prospects of a better beach tomorrow, the spectators have their speed appetites well whetted.

The Hemery Darracq again distinguished itself in the race for the Atlantic City cup, winning in straight heats, beating the Schroeder Darracq 100 yards each time in 46½ and 45½ seconds, fine going considering the slow beach and slow rolling start. The 45-horsepower English Daimler made an impressive killing, it easily winning both the touring car events, one for all cars of 60 horsepower and less and the other for foreign cars of 50 horsepower or less.

During the morning practice the 80-horsepower Napier, driven by Charles Bates, struck a rut, smashed a wheel and bent its axle. It was put out of today's running, of course, but it is expected to be in shape tomorrow.

Excellent, or, to put it even more strongly, well-nigh perfect management characterized the meet. There were no waits. "Wag" sent the cars away so promptly that the entire program was run off

within a quarter of an hour of the 4 o'clock scheduled for its ending. The rain kept home and drove many away, yet there were fully 2,000 spectators on the stand when the sunshine permitted the beginning of the programme. Summary, all races being 1 mile:

Steam record trial—Won by D. Walter Harper, Stanley; time, :51 2-5.

Heavyweight gasoline record trial—Won by S. B. Stevens, 80-horsepower Darracq, driven by A. L. Campbell; time, :39 3-5; C. A. Schroeder's 80-horsepower Darracq, driven by Wallace, second; time, :40 3-5.

Middleweight gasoline record trial—Won by the Hol-Tan Co.'s 24-horsepower Fiat, driven by Cedrino; time, :51 4-5, record for the course.

Gasoline touring cars, \$3,000 or less, fully equipped, five passengers—Won by C. W. Kelsey, 35-horsepower Maxwell; H. R. Sack, 30-horsepower Mitchell, second; D. Roy Fowler, 20-horsepower Locomobile, third; time, 1:30 3-5.

Touring cars of 60 horsepower or less, fully equipped, five passengers—First heat won by A. W. Church's 45-horsepower English Daimler, driven by H. N. Harding; Ernest Kelly, 50-horsepower Thomas, second; time, 1:12 2-5.

Second heat—Won by E. R. Strong's 45-horsepower Pierce, driven by A. B. Coles; Alf. Codman's 60-horsepower American Napier, driven by Wellington, second; time, 1:20.

Final heat—Won by Harding, English Daimler; Kelly, Thomas, second; Wellington, American Napier, third; Coles, Pierce, fourth; time, 1:08 4-5.

Free-for-all, flying start, for Atlantic City cup, best two in three heats, first heat—Won by S. B. Stevens, 80-horsepower Darracq, driven by Campbell; C. A. Schroeder's 80-horsepower Darracq, driven by Wallace, second; H. W. Gill, Stanley steamer, third; Tom Cooper, 60-horsepower Matheson, fourth; time, :46 4-5.

Second heat and cup—Won by Campbell; Wallace, second; Cooper, third; time, :45 2-5.

Price handicap for four-cylinder touring cars, fully equipped, five passengers—Won by Ernest Kelly, 50-horsepower Thomas, scratch; W. T. Smith, 50-horsepower Thomas (scratch), second; H. R. Sack, 30-horsepower Mitchell, 11 seconds, third; actual time, 1:21 3-5.

Foreign touring cars of 50 horsepower or less, fully equipped, five passengers—Won by A. W. Church, 45-horsepower English Daimler; Emanuel Cedrino, 35-horsepower Fiat, second; time, 1:10 4-5.

Gasoline runabouts, \$1,000 or less, fully equipped, two passengers—Won by Eddie Wilkey, 22-horsepower Buick; W. M. Davis, 10-horsepower Maxwell, second; J. D. Maxwell, 10-horsepower Maxwell, third; time, 1:34 4-5.

COOPER WINS MATCH

Atlantic City, N. J., Sept. 4—Special telegram—Good as were the struggles in the scheduled events, it was a match race between British and an American touring car that aroused the greatest interest and enthusiasm all around on the second day of the meet at Ventnor beach. After cleaning up handily yesterday the free-for-all touring car championship and winning the race for imported cars, A. W. Church, S. B. Stevens, Tom Moore and other partisans of the 45-horsepower English Daimler, with characteristic sportsmanship, looked about for more worlds to conquer. Tom Cooper happened to be down with a 60-horsepower Matheson, which, by reason

of being equipped with a makeshift run-about body, was eligible only in the racing classes, where he was an easy victim to the two 80-horsepower Darracqs and barred from the touring car events. Tom saw he had a winner and was willing to put up some of his own money, to which C. A. Singer, of the Matheson company, of New York, added \$100. Al Reeves, Wally Owen and some of the old bicycle crowd, who know the former cycle champion's old knack of picking up good matches, joined the American syndicate. It was a good betting proposition and the fans quickly divided into two opposing camps at even money.

When the race was called the officials and press and grandstand occupants stood up with real interest. The start was a rolling one. Harding and the English Daimler drew the pole by the ocean and got a yard or two the better of the start. The Matheson soon showed that it had the speed Tom claimed for it, and before the half-mile mark was reached had drawn up even and passed the British driver and car. The English combine made a plucky stern chase, but was beaten by the Yankee outfit by 30 yards in 58½ seconds. The hit the match with its betting adjunct made with the crowd gave Senator Morgan, who was present, an idea of making match racing a prominent feature of the next meet at Ormond and arranging so that the Florida pilgrims may have a chance to win a dollar or two toward bearing their expenses. "Wag" says he has another match booked for tomorrow.

The high speed race of the day was again a duel between the Hemery and Schroeder 80-horsepower Darracqs. It was a standing start run. This time William Wallace turned the tables on Campbell and the Vanderbilt cup winner, capturing the race in 50 seconds, good going indeed from a standing start. The touring car race honors of the day were divided between the Thomas and the Packard. The latter easily won the John H. Lyons cup for American cars of 30 horsepower and under, owners to drive, with Ernest Lash at the wheel, by 150 yards, and the former the race for touring cars selling at \$5,000 and under, with Ernest Kelly its pilot, capturing its trial and the final by two lengths from Lash each time. Summary, all events being at 1 mile:

Touring cars selling at \$5,000 or less, fully equipped, carrying five passengers, first heat—Won by Ernest R. Kelly, 50-horsepower Thomas; Ernest Lash, 24-horsepower Packard, second; time 1:17 3-5.

Second heat—Won by E. R. Strong, 45-horsepower Pierce; W. T. Smith, 50-horsepower Thomas, second; time, 1:20 3-5.

Final heat—Won by Kelly; Lash second, Strong third; time, 1:14 3-5.

Standing start, gasoline championship—Won by William Wallace, 80-horsepower Schroeder Darracq; A. L. Campbell, 80-horsepower Hemery Darracq, second; Tom Cooper, 60-horsepower Matheson, third; time, :58 1-5.

Touring cars, selling at \$1,500 or less, fully equipped, carrying four passengers—Won by D. Walter Harper, Stanley steamer; Eddie Wilkey, 22-horsepower Buick, second; John

W. Daxis, 20-horsepower Maxwell, third; time, 1:42.

John H. Lyons cup for American touring cars of 30 horsepower or less, fully equipped, carrying five passengers, owners to drive—Won by Ernest Lash, 24-horsepower Packard; Samuel W. Moore, 30-horsepower Franklin, second; G. J. Patterson, 30-horsepower Peerless, third; time, 1:15 4-5.

Special race for Stanley steamers—Won by Merrill Dobbins, J. T. Moriarity, second; George Calder, third; time, 1:21 1-5.

Match race for \$200—Won by Tom Cooper, 60-horsepower Matheson runabout; H. N. Harding, 45-horsepower stripped English Daimler touring car, second; time, :58 1-5 from rolling start.

Match race—Won by Alf. Codman, 60-horsepower American Napier; Emanuel Cedrino, 35-horsepower Fiat, second; time, 1:04 4-5.

One mile record trial—A. L. Campbell, 80-horsepower Darracq; time, :39 3-5. William Wallace, 80-horsepower Darracq; time, :41 4-5. E. R. Strong, 45-horsepower Pierce Arrow; time, 1:09 2-5. D. W. Harper, Stanley steamer; time, 1:07. Samuel W. Moore, 30-horsepower Franklin; time, 1:14 1-5. Emanuel Cedrino, 34-horsepower Fiat Junior; time, 1:05 1-5.

MATHESON SHINES AGAIN

Atlantic City, N. J., Sept. 3—Special telegram—Under wind and course conditions highly favorable to fast time the 3-day meet of the Atlantic City Automobile Club wound up this afternoon with some of the best speed performances in the history of the beach. There was a stiff wind blowing from the north and the beach was as firm and smooth as a billiard table. The time trials, which opened the afternoon's sport, were run with the wind down the beach from north to south. The Hemery 80-horsepower Darracq, which won the 1905 Vanderbilt cup race, made the mile in 37½ seconds, the fastest mile barring Walter Christie's 35 seconds last spring, scored on the beach. A most remarkable feat fell to the lot of the 60-horsepower Matheson, going the mile in 50½ seconds. The car was equipped with a runabout seat, the overflow of passengers standing on the chassis. The summary, all contests being at a mile:

Record trials—D. Walter Harper, 20-horsepower Stanley, 56 2-5 seconds; Howard W. Gill, 20-horsepower Stanley, 55 2-5 seconds; A. L. Campbell, 80-horsepower Hemery Darracq, 37 4-5 seconds; William Wallace, 80-horsepower Schroeder Darracq, 38½ seconds; Tom Cooper, 60-horsepower Matheson, carrying seven passengers, 50 1-5 seconds; H. N. Harding, 45-horsepower English Daimler, fully equipped, 55 1-5 seconds; H. S. Crawford, 40-horsepower Crawford, 1:03 3-5.

Handicaps for runabouts of all types—Won by John W. Wilkins, Jr., 40-horsepower Win-ton, 25 seconds; Tom Cooper, 60-horsepower Matheson, scratch, second; D. Walter Harper, Stanley steamer, 1 second, third, 1:35 3-5. Cooper's time of 1:05 was from a standing start against a strong wind.

Match race won by W. T. Smith, 50-horsepower Thomas; Samuel W. Moore, 30-horsepower Franklin, second. Time, 1:39 1-5. Match race of the two 80-horsepower Darracs, best two in three—First heat, standing start, won by A. L. Campbell, time 58 3-5 seconds; second heat, flying start, won by Campbell, time 49 3-5 seconds.

Handicap for cars that scored 1:10 or better at the meet, won by D. Walter Harper, Stanley steamer, 11 seconds; Tom Cooper, 60-horsepower Matheson, 10 seconds, second; H. N. Harding, 45-horsepower English Daimler, 15 seconds, third. Actual time, 1:08 4-5.

Handicap for Stanley steam cars won by D. Walter Harper, scratch; J. F. Moriarity, 30 seconds, second; time, 1:28 2-5.

TALK OF BIG TIRE TEST

English Planning 5,000-Mile Reliability Trial—Part To Be Run in Foreign Territory

London, Aug. 25—A fresh sign of the times and an indication of what may be expected in the near future is news of an alliance between the automobile club and the British Empire Motor Trades Alliance. This latter is a body which has been founded by the British manufacturing interests in the motor line for the purpose of furthering those interests in contradistinction to foreign manufacturers and importers. It has had a rather severe struggle to obtain recognition, but it seems to have secured this, thanks chiefly to the energy and ability of its secretary, J. B. King. The treaty in question has as its basis the holding of a 5,000 miles tire reliability test. This apparently is to be run under the guidance and control of the joint committee of the automobile club and the British alliance. There is nothing in the conditions which greatly differ from those of any other similar trial. There are to be five classes, three to be devoted to pneumatic tires and ranging according to the weight of the vehicle from 1 to 2 tons. Then there is to be a class for motor cars with protected tires, and yet another for vehicles suitable for commercial work fitted with solid tires. Where the novelty comes in is that in case representative makers of these tires do not enter for the competition the governing committee will itself purchase from the firms in question sets of tires, which will be fitted to cars supplied by the committee and will be driven through in the hands of official drivers exactly in accordance with the rules laid down for other competitors.

It is then disclaimed that the public will be furnished with a truly representative and impartial competition from the results of which it will be able to deduce valuable comparisons. This step has been taken because in the past firms like the Dunlop, Continental and Michelin tire companies, whose goods are probably used on nine-tenths of the motor cars in this country, refrained from taking part with the result that the competitions were robbed of all real value. A further novelty in the competition is that, although the starting and finishing points will be in London, the competition will be largely decided over continental roads. This is no doubt designed with a two-fold purpose—firstly, to prevent any suggestion of hole and corner coddling of British manufacturers, and, secondly, to enable British car manufacturers to parade to a certain extent before continental buyers who may be disposed to examine them, thus serving, in a way, to secure for the English trade the benefits which for the French manufacturers the late Circuit European was designed.

Another indication lies in the announcement that the Motor Wagon and Van Users' Association, which is the body on this side that has taken under its particular care the development of the commercial motor, has practically severed itself from the automobile club. Up to the present there has been no formal alliance, but all these trade bodies have been handled by members of the automobile club, who naturally desired to accentuate the standing of that body by inviting its assistance in various ways.

NEW MAXWELL PLANT

Elkhart, Ind., Sept. 1—That there is a good prospect of a Maxwell factory locating here is evident since the visit of the company's officials to this place this week. The proposition is being discussed by the Century Club, composed of the leading citizens, who are greatly interested in the scheme. The site sought is H. E. Bucklen's 160-acre piece just east of Allendale on the east side of the railways. The town is asked to give this realty company 150 acres of land, of which 25 acres will be set off for the plant and the rest platted into building lots. The realty company is to build and equip the factory, investing the \$250,000 in addition to the \$100,000 worth of equipment now owned by the automobile company. The realty company will then sell the automobile company this plant for \$250,000 on yearly installments of \$25,000 and interest at 6 per cent. Benjamin Briscoe, accompanied by Richard Irvin, of New York, a director and treasurer of the company, and R. A. Corbett, of Detroit, a promoting agent, visited Elkhart last Tuesday and addressed the Century Club on the proposition. The company is also considering Marion, Muncie and Kokomo, but its officers declare themselves to like the idea of settling here. It was said that this year the Maxwell-Briscoe company turned over \$2,000,000 and that another million will be added next year. It is claimed nearly 3,000 cars were made this year. Mr. Briscoe says his stockholders will probably furnish all the capital—about \$250,000.

DETROIT SHOW DATES

Detroit, Mich., Sept. 3—The Tri-State Automobile and Sportsman's Show Association of Detroit announced the past week that it had secured the dates of February 11 to 16 for its annual show, to be given during the coming year, and coupled the announcement with the fact that the Light Guard armory would be again the place for the exhibition to take place. Several other locations had been figured on in an effort to secure more floor space but the old Detroit lack of a convention hall, capable of providing floor space ample for such a show is once more in evidence in the decision of the committee to hold the exhibition at the same old place in spite of the fact that for the last 3 years, the show has entirely outgrown the place.

VANDERBILT HOSTS ARE GATHERING

New York, Sept. 4.—It seems probable now that before the week closes all the American training quarters along the Vanderbilt course will be occupied. Although the racing board's rules will not permit early morning speeding of racing machines until the 12th, the backers of the candidates for the American trials on the 22d see the wisdom of having the cars and drivers well settled on the course in advance of the serious work of time trials, that margin may be left for final tinkering with the racers and that the pilots may be thoroughly familiar with the course through touring car exploration before the flyers are put to their paces. Lee Frayer and his Frayer-Miller were the first arrivals. The car was expressed Saturday and reached here on Sunday. The other two Frayer-Millers will be shipped today. Next to arrive will probab'y be H. H. Lytle, who is expected with his Pope-Toledo on Wednesday. C. W. Spencer, of the local branch, says he saw this racer show a speed of 81 miles an hour on the third gear, the fourth speed not having yet been applied. Lytle has made a 100-mile trip into Michigan with the new car. Two 15-inch searchlights have been mounted on the car for ante-daylight running. Caillou, Le Blon and Roberts, who will pilot the Thomas Flyer trio in the trials, are at the factory. One engine on the block is said to have shown 126 horsepower at 1,200 revolutions. The other two are on the frames. The Thomas Flyers are said to have the biggest and noisiest motors of the whole American outfit. The finishing touches to the B. L. M. motor, it is said, are being put on at the Smith & Mabley shop. The car will weigh but 1,500 pounds, and be the lightest in the race. Three entrants at least, it is said, will have practically an extra car in parts on hand—Frayer-Miller, Thomas and Pope—all having taken the precaution to make complete duplicates.

The committee has chosen but is still keeping secret the exact site of the grandstand. It will have 200 boxes and be double the capacity of last year's. Alfred Reeves, who again has charge of the sale of boxes and seats, says that already half of them have been bespoken in advance of the issuance of the diagram. He can be addressed at 29 West Forty-second street. The stand for press and officials will be opposite the grandstand, as formerly. The official survey of the course is under the direction of ex-Chairman Pardington, who has not yet made public the result.

Walter Christie has had his racer apart for the last final adjustment, and expects to be at his old quarters at the Boardman place on Saturday.

Robert Graves says that Jenatzy will arrive early this month and will drive for him the same four-cylinder Mercedes he piloted last year, whose cylinder head

cracked while rushing the Bull's Head corner on the fourth round.

Ten mechanics from the Turin factory, with four Fiat racing and two trial cars, sailed last Wednesday from Genoa and will be installed at the Hol-Tan old camp at Porrier's, at Garden City, before the week closes. Lancia, Nazzaro and Dr. Weilschott will sail on the 15th, arriving the night before the eliminating trial. Close students of the chances are regarding Nazzaro as one of the most serious and dangerous aspirants for the cup. He is a sure performer, as is proved by his finishing second both in last year's Bennett race and this year's grand prix. By some his chances are preferred even to those of the meteoric Lancia.

Chairman Thompson, of the racing board, has issued the following bulletin: "Remembering that in past years it has been the custom of the public to take advantage of the Vanderbilt race to drive their cars over the official course and other roads of Nassau county at a prohibitive speed, Sheriff Gildersleeve has announced that this year, not only on Sundays, but also on week days, he will have his deputies in force on the roads to prevent speeding. It is his intention to use the methods, sometimes used in New Jersey and other places, of taking the registration numbers, without making any arrests at the time, after which warrants will be served on the registered owners. The Vanderbilt cup commission indorses his action, feeling that while they can control the entrants to the Vanderbilt race they have no control over the public. Owing to the number of entries to the American eliminating trial and considering the class of machines which will compete, there will undoubtedly be as great a demand for seats on the official stand at the preliminary contest as for the race itself. The eliminating trial this year will have fifteen machines, each the finest result of perfect workmanship and driven by both American and foreign drivers of known ability. This race should be fully as exciting as the big race itself. The ticket committee, which has the stands in charge, have decided, where requested, to make club reservation. Where applications are made as a club for a certain reservation of seats for the members, the privilege is accorded of using a banner with the name of the club or its insignia."

QUAKER MYSTERY CLEARED

Philadelphia, Sept. 3.—The mystery surrounding the failure of the two Philadelphia entries to the Vanderbilt cup eliminating trial to materialize was laid bare on Friday last, when two angry automobilists, Charles J. Swain and John N. Wilkins, Jr., came out in the public prints with an explanation of the causes of the fiasco. They put the onus on the shoulders of

F. O. Stanley, of the Stanley Motor Carriage Co., of Newton, Mass., who was to have built and tuned up for them a pair of "tea kettles," guaranteed to do a mile in 30 seconds. Swain and Wilkins, a pair of as thorough amateur sportsmen as ever turned a steering wheel, have gone to no end of trouble and expense to get cars with which to enter the American blue ribbon event. On the strength of Stanley's promises they each entered a steamer. As an evidence of their good faith in the matter it may be stated that when the entries were held up by the A. A. A. on account of having been backed by the Automobile Club of Philadelphia—which a short time before had withdrawn from the national body—Messrs. Swain and Wilkins induced the Cape May Automobile Club to stand sponsor for them. That Stanley was in earnest early in May, when the negotiations were opened, is shown by a letter received from him previous to Memorial day, when Swain and Wilkins were invited to go up to Readville to see the cars perform. Although the "tea kettles" proved to be somewhat bad actors on that occasion, Stanley, so say the Philadelphians, assured them that the defects which caused their defeat could be easily remedied, and urged them to go ahead. "You make good with the entries, and I will make good with the cars," was the way Stanley put it. After the Cape May club had assumed the responsibility for the challenge, and a few days before the entries closed, Mr. Swain, as a final precaution, before consigning the two \$1,000 checks for entrance fees to the mails, wired Stanley to let him know when the cars would be delivered. Imagine the consternation all along the line when a telegram was received from the Stanley factory saying: "Do not enter cars. See letter." The letter proved to be from Mr. Stanley, who had gone to Colorado for his health and expected to remain until fall. He deplored the fact that his poor condition and the fact that his brother would be away more or less all summer would prevent the completion of the cars in time for the races, and absolved Swain and Wilkins from purchasing them. Had not Swain, by some lucky intuition, bethought him of wiring Stanley, he and Wilkins would have lost their entrance fees. For so much good fortune they are thankful; but they feel Stanley put them in a false position before the automobile public, making it appear that they and the Cape May club were seeking a little cheap notoriety by putting in fake entries for the cup race. Swain had felt so cut up by the fiasco that he wrote Stanley asking him to make a public statement of the facts, but the "tea-kettle"-builder ignored the request. Hence the decision to call in the aid of the Philadelphia papers to set them right before the automobile

public. Several officials of the Cape May club have corroborated the statements of Swain and Wilkins in every detail, and they and the rank and file of the membership are exceedingly sore.

APPERSON UPSET

Chicago, Sept. 1—The Apperson Vanderbilt cup candidate figured in an accident Wednesday that luckily resulted in no damage to the car, although Edgar Apperson went to the hospital badly shaken up and bruised. The big red machine left Chicago on noon that day to run to the factory at Kokomo. The roads were good and with a fast machine under him, Apperson was making fine progress. At La Porte he slowed to 18 miles an hour for a turn when the car skidded to the side of the road, bursting a tire. It was the left rear and this caused the machine to upset, throwing Apperson. He was taken to the hospital at La Porte where it was discovered that outside of several severe bruises Apperson was all right, while the car practically was uninjured.

TRACY IN HIS CAMP

New York, Sept. 5—Special telegram—Joe Tracy pitched camp today at his old headquarters at Lakeville. He drove the Locomobile racer down from Bridgeport yesterday, a distance of 60 miles, at a moderate touring pace. The Apperson cup candidate is due to reach town today. The Matheson racer will not be shipped until early next week. It is having its final tuning up on an 8-mile stretch of road near Wilkesbarre. It is now said that owing to the objections of his parents, young Sidney Breese will resign his place at the wheel of the B. L. M. racer to an experienced French racing chauffeur. Not only is the oiling of the course proceeding rapidly, but the improvement of the road at various points as well. There will be a meeting of the racing board early next week to make final arrangements.

TIRE COMPANIES MERGE

New York, Sept. 1—Announcement has been made of an important tire manufacturing consolidation. The Ajax Standard Rubber Co. has amalgamated with the Grieb Rubber Co., of Trenton, and the new company will be known as the Ajax-Grieb Rubber Co. with the plant at Trenton, and the executive offices in New York. Horace DeLisser, who has been president of the Ajax company, will be the head of the new combination, with C. H. Oakley, vice-president, and Harry Grieb, secretary and treasurer. Hereafter Ajax tires will be made in the big plant at Trenton, to which two more factories will be added this autumn, one 400x500 feet and the other 120x150 feet. The Ajax company has its chief backing from A. M. C. A. leaders and was lately brought into permanence through the offer of a 5,000-mile guarantee for its offer of a 5,000-mile guarantee for the tires it manufactures.

MANY IN HILL CLIMB

Chicago's Initial Attempt Draws Out Fifty Cars for the Contest At Algonquin, Ill.

Chicago, Sept. 4—That Chicago should have the hill-climbing fever and put in fifty cars for the contests to take place at Algonquin, Ill., Thursday of this week probably will surprise those of the east who hitherto have had a monopoly of these events. It is a flat country around here and that the Chicago Automobile Trade Association and the Chicago Automobile Club should have nerve enough to attempt anything of the sort is to be wondered at. But their committee, consisting of J. F. Gunther, W. L. Githens and Thomas Hay, has had the nerve to go ahead with the proposition and now the indications are that the first attempt will be a model of its kind. At any rate Chicago will have the satisfaction of knowing that it is the first to attempt to run a double climb and also the first to run a handicap in this country. Therefore, unusual interest ought to be attached to the Algonquin contests and if they are the successes anticipated it is more than probable that others will imitate. The formula which will be used is an adaptation from the one in use in Great Britain, the change being that horsepower does not figure in the reckoning. Instead the cylinder dimensions are multiplied by the time in seconds and then divided by the weight of the car. In this way every car will have a chance in its respective class.

Some one told Gunther he would be lucky if he had forty cars, that that was the extreme limit, but on Saturday, when the lists closed, they kept pouring in until his final count disclosed that fifty had been named. This half-hundred is made up of twenty-nine different makes of cars, with ten in class A, for cars listing at \$1,000 and under; six in class B, for cars between \$1,000 and \$1,750; eighteen in class C, for cars between \$1,750 and \$2,500; fifteen in class D, for cars over \$2,500, and one in class E, for steamers. The steamer class, however, will have to be called off for the reason that the rules require that three machines have to start to make a contest. Webb Jay, manager of the local branch of the White, protested because he was not allowed to compete with the gasoline tribe, but this was impossible because under the formula the White cannot be handicapped.

The twenty-nine makes are distributed as follows: Rambler and Mitchell, 4; Apperson, Autocar, Pierce, 3; Maxwell, Jackson, Stoddard-Dayton, Queen, Simplicity, Buick, Pope-Hartford, National, Stevens-Duryea, Knox, 2; Ford, Cadillac, Reo, Elmore, Wayne, Haynes, Premier, Moline, Pope-Toledo, National, Stevens-Duryea, Stearns, White, 1. It is proposed to make the affair the occasion for a general outpouring of motorists, the Chicago Automobile Club hav-

ing undertaken to conduct a run out to Algonquin, starting tomorrow afternoon and stopping for the night at Elgin, which is 10 miles this side of Algonquin. This ought to bring out about fifty or sixty cars which with the fifty that will compete will make a grand showing in the little town. One of the features will be the fourteen-passenger Knox bus which George Crane has turned over for the use of the newspaper men. This big machine will take the bunch out there and back.

CLEVELAND COMPANY ORGANIZES

Cleveland, O., Sept. 3—A change has been made in the affairs of the Cleveland Motor Car Co., producing the Cleveland car. For the past 2 years this company, which was not incorporated, has been managed by William L. Colt, and his success has led to the formation of a company incorporated under the laws of the state of Ohio, with a capital stock of \$300,000. Last Saturday the Cleveland Motor Car Co. was formally organized, and the permanent organization was completed as follows: President, William L. Colt; vice-president, James Laughlin, III; secretary and treasurer, A. R. Davis; engineer and superintendent, S. W. Hartley. The directors elected were: James Laughlin, Jr., of the Jones & Laughlin Steel Co., Pittsburgh; H. Hughart Laughlin, of the Jones & Laughlin Steel Co., Pittsburgh; Dexter Fairbank, of Chicago; James Laughlin, III, A. R. Davis, S. W. Hartley, W. L. Colt. For the season of 1907, an output of 250 30-35-horse power Cleveland cars will be marketed. The Cleveland car is built upon chassis manufactured by the Garford Co., of Elyria, and the Cleveland Motor Car Co. will have its own factory for the finishing of the cars in the Whitney Power block at East Twelfth and Power street, Cleveland. S. W. Hartley joins the company October 1.

GOPHERS PLAN DAY TOUR

Minneapolis, Sept. 3—Plans are being made by the Minneapolis Automobile Club for a 150-mile endurance run to St. Cloud and return, to be held late in September, and which is expected to be the first of many regular endurance tours. This will not be an economy test, like the 1-gallon test recently held, but will be a reliability trial, patterned after eastern tours, and after the Chicago-Elgin-Aurora trip. The tour is expected to take 1 day. The roads to St. Cloud are excellent in decent weather, and the course is famed as one of the long-distance bicycle courses of a few years ago. The club members promise a large number of entries for the day's run, enough to give the tour great interest to all owners of machines in the Twin Cities. The St. Cloud course leads through Anoka, Elk River, Big Lake, Becker and Clear Lake. The course is measured at 144 miles, and furnishes a fair variety of roads for the entire distance.

N.H. Van Sicklen, Manager

MOTOR AGE

Charles P. Root, Editor



The Western News Company of Chicago and Its Branches Supply Newsdealers

New York Office
29 West Forty-second Street

309 Michigan Avenue, Chicago
Published Every Thursday by the Trade Press Company
Subscription Two Dollars a Year Foreign Subscription Four Dollars

Entered at the Chicago Postoffice as Second-Class Matter

Official Organ of the
American Motor League

MAKING EXPERIMENTS

FTER the Vanderbilt cup race has been run and won the world will know more about multi-cylinder motors than it does at this stage, for one maker has been brave enough to not only risk defeat but engender criticism through building one cup candidate with eight cylinders and another with twelve cylinders. The foreign competitor sticks to the four-cylinder proposition absolutely and, at least up to this time, has been able to win on that basis. Because of the attitude of the foreigner in the matter of design, the boldness of the American maker is all the more marked, particularly inasmuch as a precedent is to be established. We have had six-cylinder racing cars, air-cooled racing cars, front-drive racing cars, and pretty much all that has been thought of by designers, but this year's Vanderbilt cup race is to present something out of the ordinary in multicylinder cars. What these cars will do must at this time be more or less of a problem, to the maker as well as the public, for what they can be depended upon to do in the matter of speed will not necessarily indicate that a race can be won with them. A good deal will depend upon how they can be handled on a winding road. The American makers who are bold enough to overlook precedent and strike out in a direction that is believed to be right should be encouraged and congratulated, for they will be responsible for that advancement that is sought in all lines and in all directions.

A MOVE TOWARD PLAINNESS

HE AUTOMOBILE, having now proved itself a practical thing, is playing a most important part in the commercial side of life outside of being used as a vehicle for hauling heavy loads. It is today used by many individuals, and where so used it is the rule that the owner is so situated he is compelled to care for his own machine. To keep even a runabout wiped up, the brass polished, the lamps filled, and the car looking even presentable requires more than a full hour each day. There is a tendency now to do away with some of the fancy parts on the automobile. The man who uses a car for pleasure and who is able to support a chauffeur need not worry about the work required to make his rig presentable. Pol-

ished brass trimmings undoubtedly tend to improve the appearance of a car, but unpolished brass detracts from the otherwise decent appearance. Many an individual owner has been compelled to have the brass parts painted, enameled or oxydized in order to save time and yet have his car fairly presentable. Makers are beginning to realize the situation and are preparing to furnish cars with the brass parts finished in colors to match the bodies. A Detroit maker is out with an announcement to this effect, as will be seen in another column. It is a move in the right direction and should prove very beneficial to the industry, in that a prospective purchaser will feel he can own a car and not be compelled to spend too much time as a porter; naturally, he will feel more like buying and using a car. The car that is used during the day as a business proposition and in the evening as a pleasure vehicle, pure and simple, is apt to have a poor appearance alongside the car that is cared for by a chauffeur, and the users thereof naturally feel some slight embarrassment driving a dingy-looking affair on the boulevards when a neighbor is out

with a car that reflects rays of light from all parts. The practicability of the automobile is gradually overshadowing the fancy appearance, as it well might. If the automobile is to remain in public favor, not only as a pleasure vehicle but one for business uses, it must be brought down to a practical basis, requiring less care than it does today on the part of the owner-driver. Simplicity in design, absence of unnecessary parts and plainness and substantiality in finish will tend to bring about the desired result more than anything that can be suggested to the automobile manufacturers.

CYLINDER CAPACITY TESTS

IT HAS long been a disputed point as to what is the correct basis of handicapping in endurance; reliability, speed and economy tests for automobiles, but so far nothing that has been tried has proven satisfactory to either the officials or the contestants. Chicago is today trying a form of handicapping in a hill-climbing contest which, it is believed, will come nearer being a solution of the problem than anything that has been presented. It is not exactly new, for the matter has been under consideration for a couple of years, though without sufficient trial to be thoroughly judged. There can be little doubt that the matter of cylinder capacity should form the basis for all contests and this is the basis for handicapping the Chicagoans have adopted. It is not a question of compression or whether the stroke should exceed the bore—it is a question of how good a maker can produce a motor and what that motor—of a certain size—can do in hauling a certain load. It is up to the maker to outstrip his competitor in the matter of quality of work—it is not a question of power at all. One maker may produce better results with a comparatively small motor than another with a much larger one. The comparison should naturally be how fast a motor of a given size can haul a certain load a given distance as against another motor, which, being larger, must naturally carry a heavier load and carry that load faster. The test that is being made by the Chicagoans will doubtless bring out some incongruities, but it will be the basis of fixing upon some form of handicapping more equitable than any that has been adopted in this country heretofore.



Annual fall meeting of Atlantic City Automobile Club is held at Ventnor beach, one of features being match racing in which Tom Cooper and the Matheson stars; fast time made over the sand.

Vanderbilt cup talk is starting in east and in another week several of American candidates will be on Long Island; drivers studying lay of land in preparation for trial on 22d.

Fifty entries are received for Algonquin hill-climb of Chicago Automobile Trade Association and Chicago Automobile Club; first test of handicap in this country.

Ajax Standard Rubber Co. amalgamates with Gribel Rubber Co., of Trenton, N. J.; new concern to be known as Ajax-Gribel Rubber Co.

Philadelphians explain why city is not represented in Vanderbilt cup race by two steamers; blame placed on maker.

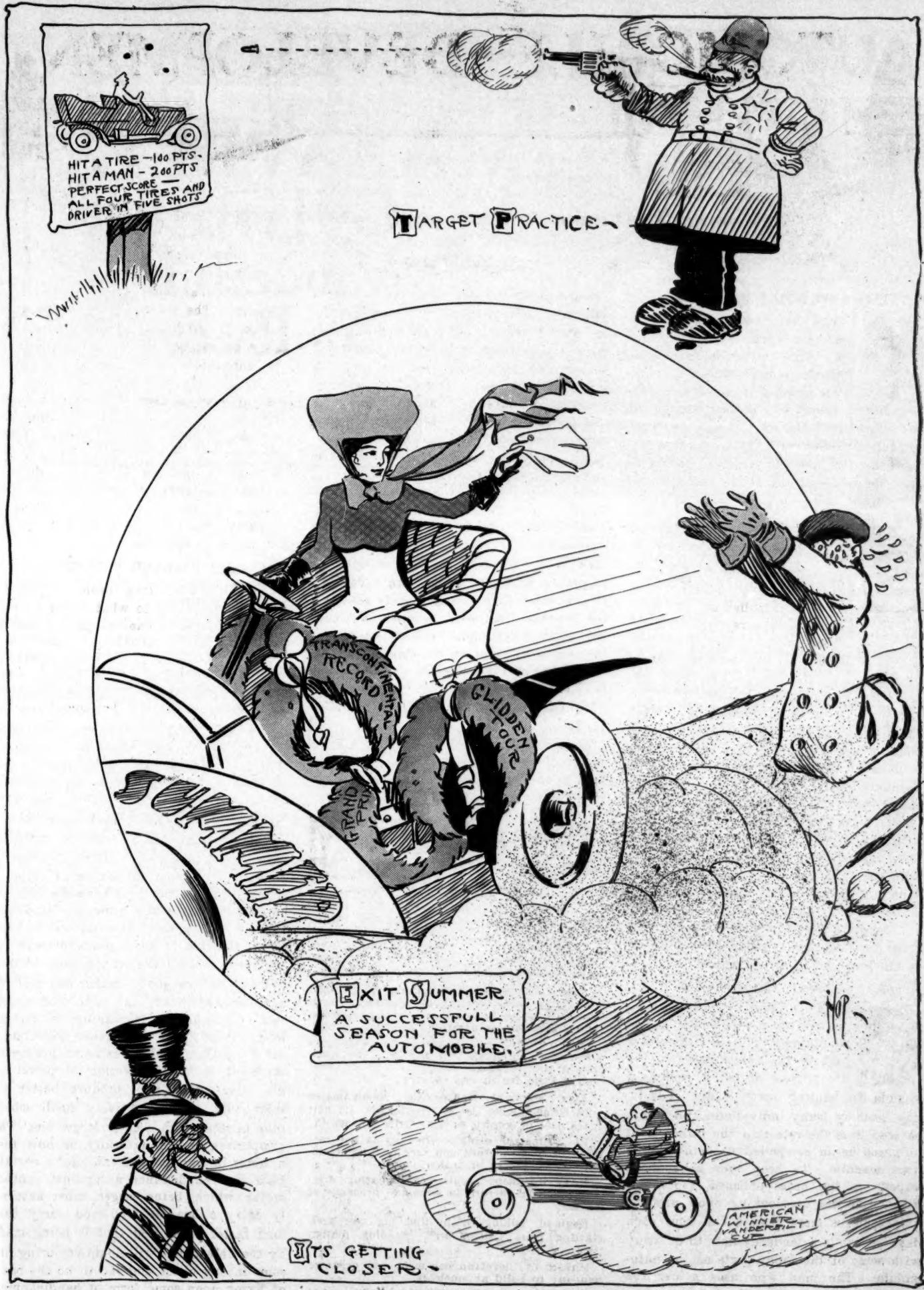
Maxwell-Briscoe people contemplating erection of model factory in Indiana—probably at Elkhart.

England talking of holding big tire test, starting from London and invading foreign territory.

Makers of Cleveland car meet and organize company to build automobiles.

Description of twelve-cylinder Maxwell Vanderbilt cup candidate.

February 11 to 16 announced as Detroit show dates.



SUMMER IS OVER—NOW FOR THE VANDERBILT

AUTOMOBILE DEVELOPMENT



THE keynote of the Maxwell twelve-cylinder racing car is that it gives us the gasoline engine, without a flywheel, for the first time as built by a representative motor maker. It is because of the prominent position in the trade of the Maxwell-Briscoe Motor Co., Tarrytown, N. Y., that we must watch this racing car with its novelties, in a flywheelless motor and in other points as well, with interest in any performance that it may be put through. Courage must be credited to its designer in doing away with the flywheel and acclaim given if steady running is proved by time.

The aluminum casing containing the crankshaft, the multiple disk clutch and the two speeds, forward and reverse, of the sliding type, is all in one casting without a joint in its entire length. Three-point suspension is used, the rear end of the case resting on a U-shaped cross member with thick walls and looped down and up again in its reach from side frame to side frame. The two base points of the triangular suspension are at points between the second and third cylinder on each side of the engine. A leaf has been taken from bridge engineering in the construction features at these two base points. Mounted on each side frame is a standing rocker bearing in the eye of which is a pivot stud projecting from a girder plate, of scalene triangular shape, just under the apex. These girder plates are bolted to the heads of the cylinders.

Projecting on each side, from the crankcase portion of the all-in-one-aluminum case are six cylinders with $6\frac{1}{4}$ -inch bore and 6-inch stroke, each cylinder on the left, looking from the seat, being just a little back of its mating right-hand cylinder, as is common in opposed cylinder

construction, to bring the big ends of the connecting rods to one bearing on the crankshaft and at the same time to avoid offsetting the connecting rods. Counting in the order thus given, that is notating the forward right-hand cylinder as No. 1, the forward left-hand cylinder as No. 2, the second cylinder on the right as No. 3, the second on the left as No. 4, and so on to No. 12, the order of explosions is:

Cylinder No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

Explosion No. 1, 10, 11, 2, 3, 12, 7, 4, 5, 8, 9, 6.

Or in this order:

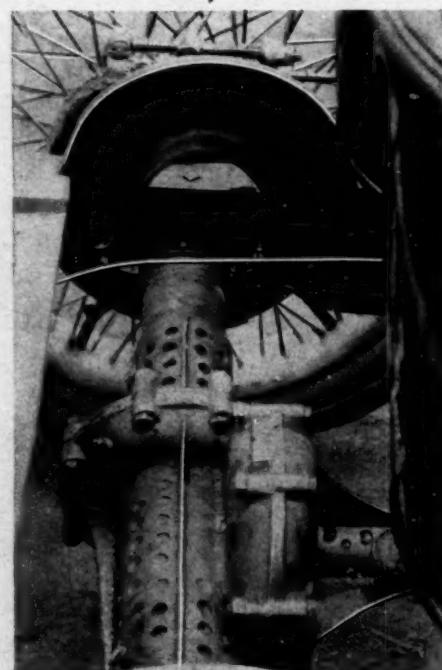
Explosion No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.

Cylinder No. 1, 4, 5, 8, 9, 12, 7, 10, 11, 2, 3, 6.

The exhausts are at the forward sides of the explosion heads and each exhaust is carried separately to the air through right angle elbows made of copper and changing to oval section at the bend. All valves are mechanically operated from one camshaft at the top center of the aluminum case. The push rods are L-shaped with the short leg pointing down. The half-speed gear is at the forward end of the case. The case just back of the last cam drops for a short distance to the top line of the rear section. Through this wall projects the camshaft for the commutator attachment. The commutator at present in use is a temporary arrangement. The spark plugs are screwed into the valve head centering on the two valve housings.

Each battery of six cylinders has its own carburetor, placed low and at a point about midway of the gearcase section of the aluminum casing. A double elbow leads to a straight-away pipe running across the heads of the cylinders and from this pipe each intake valve is fed through a short elbow, the intakes being at the back of each head. The oil system feeds to a point on the top side of each cylinder, the entrance hole being uncovered by the piston in its forward movement and between piston strokes the oil drops into a groove in the top edge of the connecting rod. Jump spark ignition is used with a circular commutator having the twelve binding posts around its periphery. At present the car is equipped with six two-cylinder coils, three on a side. These are to be replaced with two six-unit coils, one on a side, as soon as they are received from the coil maker.

One of the distinct novelties previously referred to is in the water connection from



MAXWELL REAR AXLE

the radiators to the cylinder heads. Most of us are familiar with the thermo-syphon system of cooling, that does away with the pump, and that has a feeder pipe from the radiator to the engine and a return pipe from the engine to the radiator, as exemplified by the hot water tank in connection with kitchen ranges.

But who known of an instance in automobile construction where the water circulation goes a step further in simplification and has one pipe acting both as a feeder and a return. That is the system employed on the twelve-cylinder Maxwell racer. If sanction is needed for this method, which may seem radical at first, it is only necessary to turn to household conditions again to find this system used where hot water heating is used.

In detail, each cylinder has a short pipe, of about 3-inches in length, with a diameter of 2 inches, projecting up from a point over the exhaust valve to the bottom of the radiator. There are two of these radiators, long and narrow, positioned over the cylinder heads, giving a distinctive appearance to the car especially from a front view. Each radiator is built up of vertical tubes of about $\frac{1}{2}$ -inch diameter, there being twenty-six of these tubes counting fore and aft and six across. They are arranged in groups of three in diagonal lines with thin cooling flanges liberally punched for upset holes.

The drive from the clutch is through a propellershaft to a bevel gear at the rear



BETWEEN THE MAXWELL RADIATORS

axle without differential at either end. The bevel pinion is on the rear axle, not on the propellershaft, giving a ratio of drive of one to one and a half. The housing for the gearing is liberally honeycombed. The wheels are wire with seventy-two tangent spokes in each, having eight crossings. The tires are 34x4 inches front and 34x4 $\frac{1}{2}$ inches rear.

The side frames are given a long, straight-sectioned camber with the greatest width forward. Cross frame members

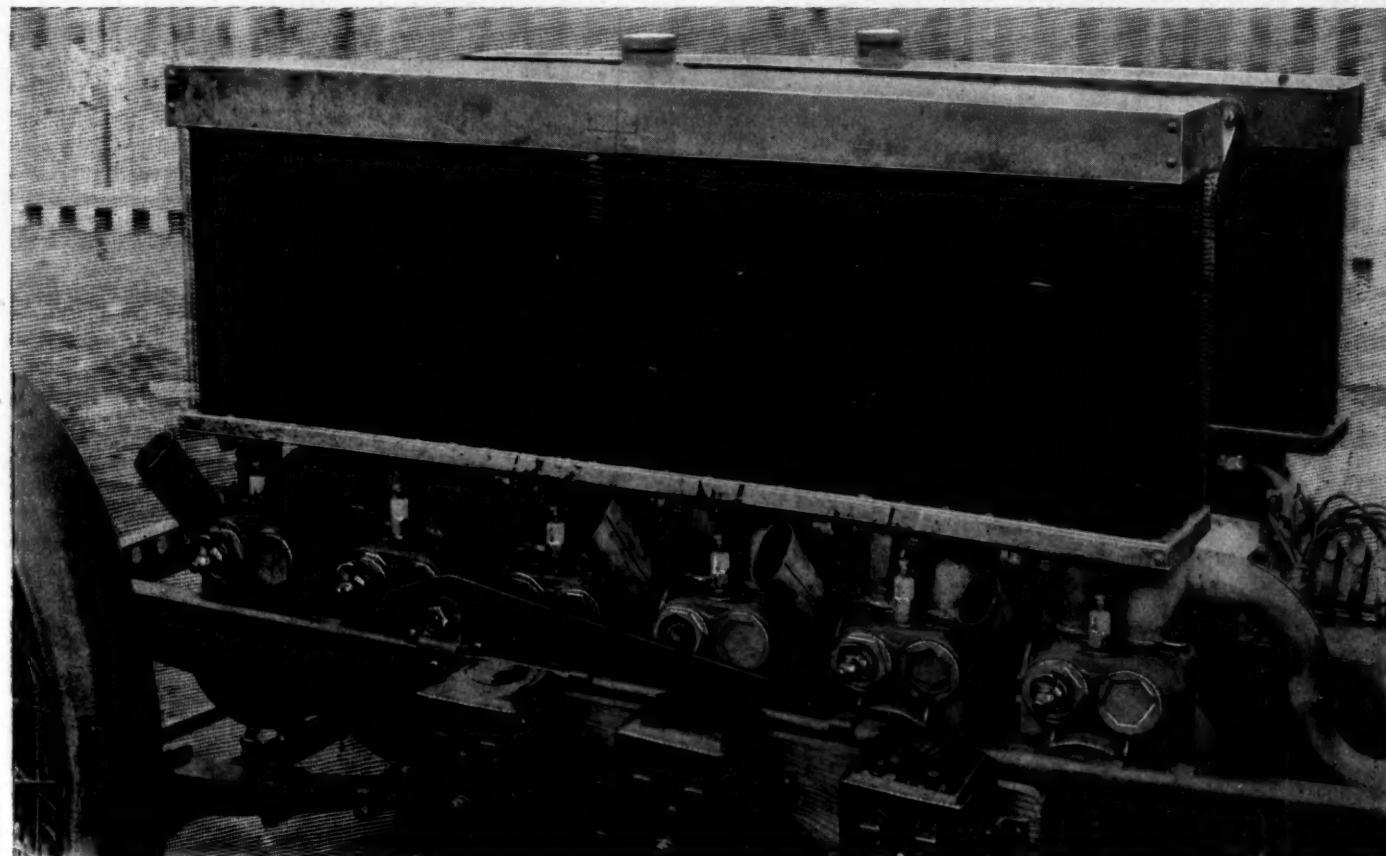
are placed at the front, at the rear of the power case, at the front hangers for the rear springs and at the rear. The front and rear members are regular E channel shape with lips top and bottom. The member at the rear of the aluminum case is U-shaped. The member at the forward end of the rear springs is like a section from the side frames and, passing over the propellershaft, is upwardly looped for spring action. The side frame members are also upwardly looped where they pass over the rear axle, for the same spring action.

The rear springs are 40 inches on centers and the front springs 36 inches on centers. The wheelbase is 115 inches, with the standard tread of 56 $\frac{1}{2}$ inches.

Speed change is through foot lever and side lever working over a notched quadrant. The speed changing slide bar is inside the gear case with notches along its side for the locking segment that must be thrown out of engagement, through the clutch pedal, before the gear lever can be moved over its quadrant.

FRAYER-MILLER RACERS

Apart from the novel method of air-cooling employed in Frayer-Miller cars, the three entrants for the Vanderbilt cup eliminating trials merit additional attention, owing to the use of the Belden two-speed and reverse transmission, which is, in itself, a novelty in many regards. This transmission came before the public at the New York shows last January, and since then has been attracting attention by its services on many makes of cars. This



LEFT SIDE OF MAXWELL TWELVE-CYLINDER RACER, SHOWING DOUBLE RADIATORS AND SHORT EXHAUST PIPES



MAXWELL TWELVE-CYLINDER RACER, WITH ITS DOUBLE RADIATOR SCHEME AND WIRE WHEELS

transmission affords direct drive on both forward speeds, as well as on the reverse, and a reference to the illustration detailing it will reveal how this is acquired. The illustration shows a set for three speeds ahead. The gears in case of shaft-driven machines, like Frayer-Millers, is carried in a housing on the back axle in union with the differential gears, and in cars driven by side chains is incorporated with the casing for the jackshaft.

The illustration shows the design for shaft drive in which the shaft F couples direct with the friction clutch within the flywheel, and carries on its rear a spur pinion A and a bevel pinion B, the latter for meshing with the large bevel gear C on the rear axle G, and the former spur pinion for engaging with the gear E. On high speed ahead the gears are as illustrated, in which case the bevel pinion B is in mesh with the large bevel gear C and drive is the same as on any direct drive in any shaft-driven machine. For the other speeds ahead the heavy spur gear D is slid along the shaft G through the use of a side lever close to the driver. For second speed ahead the gear D meshes with the outer row of studs H on the rear side of the gear E, in which case the drive is through the pinion A to the gear E and thence through gear D and the axle G and differential K to the road wheels. In getting this speed two movements are needed: First, the gear D has to be shifted to the left; and, second, the gear E has to be carried slightly to the rear so the studs H mesh with the teeth in D. Both of these movements are accomplished through one lever, the drawing of the lever back in its quadrant accomplishing the sliding of D and the thrusting it in deep side notches in the quadrant accomplishing the back movement of gear E. For slow speed ahead gear G is slid still further to the left, meshing with the inner circle of studs, and gear E is moved into

mesh as before. For reversing gear D is moved to the left beyond the axis of gear E, so as to mesh with either the inner or outer circles of studs. It must be understood that when the gear D is slid along the axleshaft so as to mesh with either circle of studs on the face of gear E that the bevel C is at the same time moved out of mesh with the pinion B. This means that on direct drive the power is transmitted through the bevels C and B, but that on the other two speeds ahead and on the reverse these gears are out of mesh and run idly on their shafts, the drive then being through the pinion A, the gear E, the large toothed gear D, and then to the shaft and through the differential to the right road wheel. The studs H can be of any desired size, as can the teeth in gear D. Gearsets with four or five forward speeds are possible under the construction.

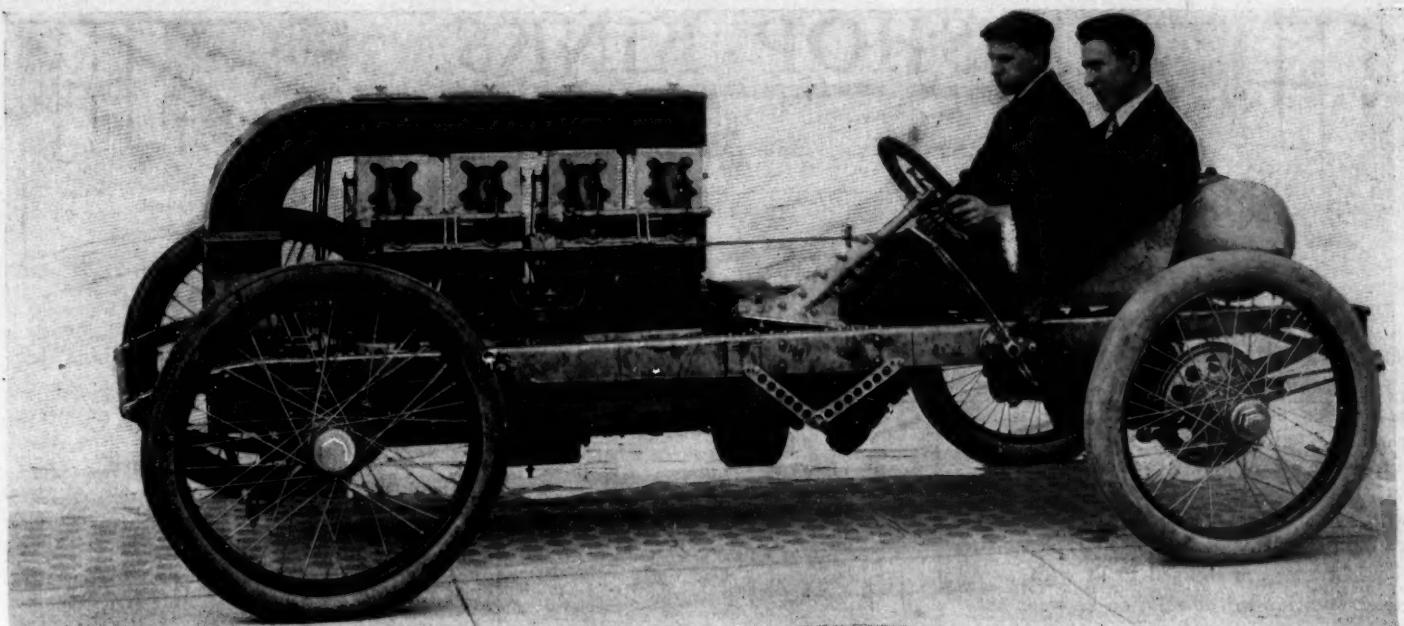
Apart from this novel transmission the cooling system employed by the Oscar Lear Automobile Co., of Columbus, O., in its cars, commands examination owing to its air jackets and blast fan, which di-

rects an air-draught over the heads of the cylinders and within the jackets. The motors comprise four cylinders each, with $7\frac{1}{4}$ -inch bore and 6-inch stroke, the making of the bore longer than the stroke being in keeping with all tendencies in European racer build. The nominal horsepower is 110 with normal crankshaft speed. Ignition is by jump spark with plugs placed vertically in the heads midway between the inlet and exhaust valves and current from storage cells; a Frayer-Miller carburetor furnishes the mixture; and valve actuation, mechanical throughout, is through typical rocker arm design. Final drive is by propeller shaft. In the running gear are incorporated tubular front axle, wire wheels 34 by $3\frac{1}{2}$ inches in front and 34 by 4 inches in rear, internal and external regular and emergency brakes on the rear hubs, Diamond tires, annular ball bearings, and weight 1,850 pounds. The gearing is on a one-to-one ratio, there being a revolution of the back wheels for every revolution of the crankshaft when running on the high speed.

Both driver and mechanician sit extreme-



ROLLS-ROYCE TOURIST TROPHY CAR



FRAYER-MILLER 110-HORSEPOWER VANDERBILT CUP RACER WITH NOVEL TRANSMISSION

ly low and slightly in front of the back axle, the former a little in advance of the tother. To conform with this location the steering column, made fairly rakish, is well back, rising from the right and in rear of the motor flywheel. The gasoline tank is carried behind the seat. In reducing weight, to come within the limit, perforating of frame parts has been resorted to wherever possible.

ROLLS-ROYCE TOURIST

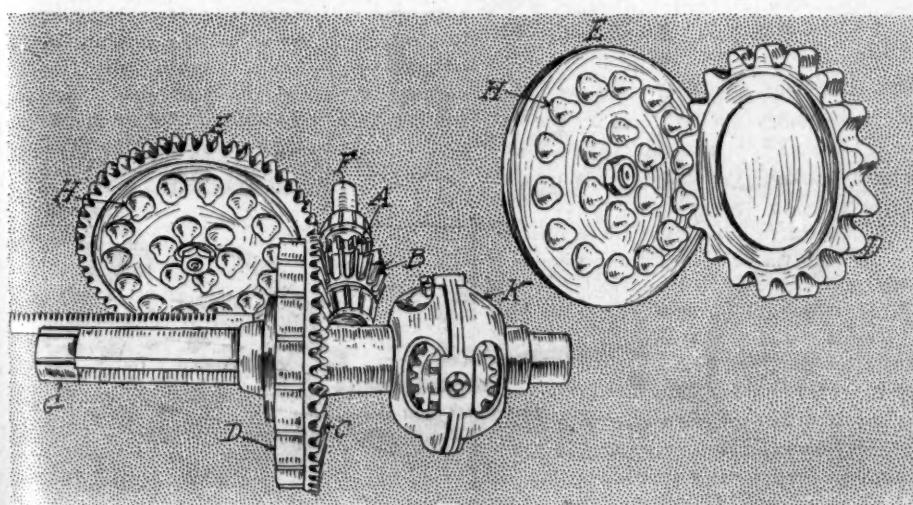
The first of the tourist trophy cars to be completed in England is the Rolls-Royce, a machine most favorably known abroad and one that made an excellent showing in the trophy race a year ago. The new car is almost identical with the one that took second place in the run last year except that the gear ratios in the four-speed and reverse gearset have been altered. First speed is now 15 miles per hour, second speed, 20 miles; third or direct speed, 36 miles, and fourth speed, 50 miles. Using direct drive on the third speed is adopted as most of the running is on this ratio, the high being a very fast gearing with the

back wheels revolving faster than the crankshaft of the motor.

The gearset carries both main and countershaft in the same horizontal plane, with the case divided into an upper and lower half, with the split in line with the middle points of both bearings. Two sliding gearsets work on the keyed shaft and on the countershaft are five fixed gears of the ring type bolted to integral flanges with the shafts. Ball bearings carry both shafts, there being three for the mainshaft, two at the forward end, one at each side of the clutchshaft gear. For direct drive dental face teeth on the plate on rear end of the clutchshaft interlock with similar teeth on the front gear of the mainshaft. Both sets of sliding gears are worked through one shifting rod encased within the mainhousing and operating in the oil bath of the gears. Dust is excluded from the main and countershaft bearings by dust caps, those on the countershaft covering the entire end of the shaft and threading into the case and those on the mainshaft similarly designed except with an opening for the shafts. Final drive is by

propellershaft with a universal joint at the front end encased in a housing secured to the back face of the brake wheel on the shaft and that at the rear also housed, each containing an oil bath. Ball-bearings of the Hess-Bright type carry all moving parts in the back axle. To avoid distortion a bearing is placed in front and one behind the bevel pinion on the rear end of the driveshaft. The back axle is of the floating type and on the rear wheels are drums for expansion brakes. Dustproofing in the transmission system is noticeable and undoubtedly owing to it is accountable much of the economy of the car on its run last year.

The leading agent in the economy of the run was the carburetor of Rolls-Royce lines. It is of the two-chamber style with float to right and mixing chamber at left. The float is of the common make with rigid stem and needle valve on stem base. Air entering has a choice of two courses, one past the vertical nozzle in the center of the passage and another by way of an auxiliary opening, the air taking the latter course not passing the nozzle and thus tending to give a mixture of more uniform richness for varied motor speeds. To avoid entrance of dirt the intake pipes for the air ends upward and are covered by a hood projecting over the top of the tube necessitating the entering air rising between the outer tube walls and the inner edges of the hood. The entrances are further protected by fine gauze. In the ignition scheme synchronized ignition is used. By synchronized is meant that in which a single coil steps up the current from the batteries and a distributor delivers this high-tension current to the cylinders in proper order. The maker carries the distributor on the rear side of the dash in full view of the driver and drives it from the rear end of the camshaft by a vertical rod and bevel gear at the bottom and spur gear with worm on top.



TRANSMISSION USED IN FRAYER-MILLER VANDERBILT CUP CARS

SHOP KINKS

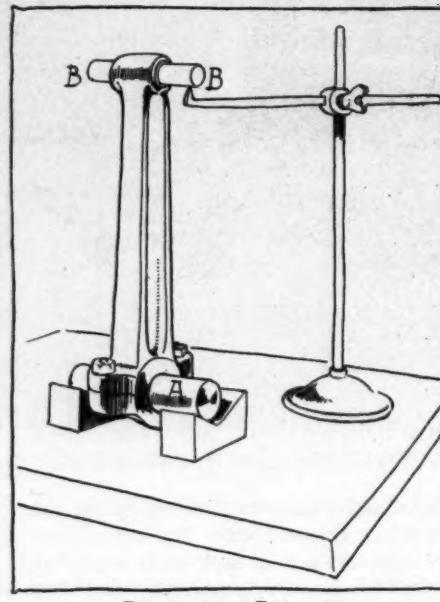


Paralleling Piston and Crankpin Bearings

It is easy enough to bore the large and small ends of a connecting rod parallel when one has the proper fixtures for the purpose, but probably some owners of cars have wondered how the same necessary parallelism is obtained when the crankpin brasses have been rescraped. These brasses are scraped to fit with very little attention to the relation between the wristpin bushing and the crankpin, and the two are brought parallel, when the scraping is completed, by bending the rod. The parallelism of the bearings is tested as shown in the sketch. A plug or mandrel ground to fit the wristpin bushing is inserted in the small end, and a mandrel A of the diameter of the crankpin is clamped in the large end. Then the larger mandrel A is supported on V blocks on a surface plate, and an adjustable testing tool is employed in the manner shown. If the bearings are not parallel one of the ends of the upper pin BB will be higher than the other. The rod is laid sidewise with its ends on two blocks and is struck centrally a smart blow with a hammer. It is then tested again, and the operation repeated as indicated. The process requires a good deal of skill and judgment, as the difference in height between the ends BB may not be more than a few thousandths of an inch and too hard a blow will make matters worse than before.

Using a Monkey Wrench

The proper way to use a monkey wrench is that shown in the sketch. If the wrench is reversed so that the force is applied to the handle in the opposite direction the jaws are much more likely to spread, since the stationary jaw A is seldom able to stand the leverage applied to its extreme end that the movable jaw B will stand. The reason for this is to be found



PARALLELING BEARINGS

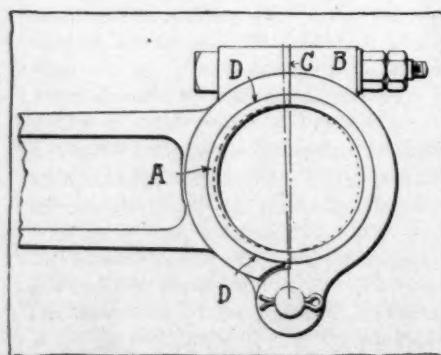
simply in the shape of the jaws as they are ordinarily formed. It is evident also that the more snugly the jaws are screwed up to fit the nut the smaller will be the spreading force between them, and the less likely the jaw A is to be bent.

Temporary Pump Repair

The shaft of a centrifugal water pump will corrode and wear rather rapidly at its water end, owing to the difficulty of keeping it sufficiently lubricated, and in time it will become so wobbly in the stuffing box as to make it difficult to keep the latter tight. Until it is deemed necessary to put in a new shaft and stuffing box, the best way to pack the stuffing box is not to crowd the packing as tight as possible but to leave it loose and fill it with all the grease it will take. For this purpose non-fluid oil is preferred because it does not melt when the water becomes hot. A fairly stiff grade should, of course, be used.

How to Use Taps and Dies

No true mechanic will ever use a monkey wrench on a screw tap. More taps are broken through this slovenly practice than in any other way, and, in fact, it is next to impossible not to break a tap through the one-sided force thus exerted if the material to be threaded is at all hard. The only proper device is the tap wrench, which imposes no bending stresses on the tap, because both of its arms are of equal length. If the tap is used in wrought iron or steel, oil should be used with it and the tap worked in gently with quarter turns backward and forward as soon as it begins to take hold. If the hole is deep the tap should be taken



REFITTING CONNECTING RODS

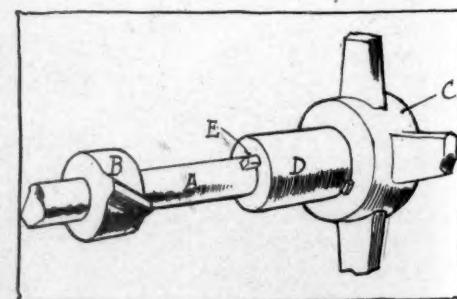
out occasionally to clear it of chips. A bottoming tap should never be used except after a regular tap. A die or screw plate is not so easily broken as a tap, but it demands, if anything, more of a knack to use it correctly. The end of the blank rod which it is desired to thread should be filed slightly tapering to give the die a chance to start, and great care should be taken with the first few threads to work the die in a plane at right angles to the axis of the rod. If the die is allowed to wobble—and it is difficult to prevent it from wobbling—some of the teeth of the die are likely to be broken. If it is desired to cut threads to a shoulder the die must be used in the regular way as far as it will go, and then run off and reversed. This will cut full threads right up to the shoulder.

Treating Worn Disks

A number of automobiles have multiple disk clutches made up from stampings made of cold rolled sheet steel. These stampings have internal strains which remain in them from the process of rolling, and when the surfaces of the disks become worn they warp out of shape. If this occurs it can be remedied by annealing the disks.

Remedy for Thrust Wear

Cars which drive through a propeller shaft are often provided with inadequate means for taking up the thrust due to the square slip joint in the propeller shaft. This thrust is due to the friction between the two members of the slip joint when the body plays up and down relatively to the axle, and unless the joint is enclosed and lubricated the thrust will be considerable, although the motion is small. It is not uncommon to find the gear shaft thrust bearing adjacent to the brake drum completely worn out as a result of the unfair loads put upon it in this way. It is

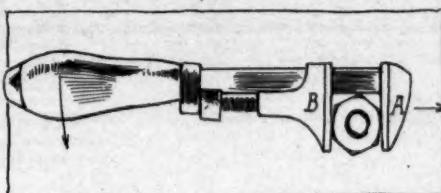


CAUSE FOR POUNDING

seldom possible to supply this oversight after the car has been built, and the only remedy is to watch the thrust bearings of the gear case and take them up when necessary. If the bevel driving pinion does not run in ball bearings it will require the same watching, as it is subjected to practically the same thrusts.

Cause for Pounding

A recent case of irregular pounding in a four-cylinder engine was traced to a combination of carbon in the combustion chambers, causing preignition and loosening of the spark timing mechanism. The symptom was a sharp metallic pounding, which did not continue after the switch had been opened, and which, contrary to the usual experience where preignition alone is concerned, became more marked as the speed of the engine increased. Ignition was by contact spark, and the spark timing was changed by shifting the inlet valve and ignition camshaft—which performed both functions—along its axis. The arrangement is shown roughly in the sketch, in which A is the camshaft, B one of the ignition cams and C the hub of the two-to-one gear. This gear was



USING THE MONKEY WRENCH

keyed on a bronze sleeve D, which turned in a bearing and in which the shaft slid lengthwise. A feather E established the connection between A and D. On taking things apart it was found that the feather was exceedingly loose in both A and D, and it was inferred that the springs of the inlet valves exerted so much force on A as to cause it to jump rotatively back and forth when the valves opened and closed. A tight feather which was let deeply into A cured part of the trouble, and scraping the carbon from the combustion chambers cured the rest of it.

Refitting Connecting Rods

About the worst form of connecting rod to refit after it has worn out of round is that with the hinged cap shown in the sketch. The reason for this is easily un-

derstood by reference to the dotted lines, which show, slightly exaggerated, the wear which may take place in the brass A, and the corresponding movement required of the cap to take it up. It is evident that whatever wear A has sustained double its extent must be filed off from the upper portion of B of the cap to produce a fit on the crankpin, and, moreover, the surface C must be filed slightly tapering instead of parallel. It is next to impossible, always undesirable, to attempt to refit a crankpin bearing by putting a liner between the brass A and its seating. The reason lies in the fact that the pressure per square inch on these bearings is so great that it is impossible for a brass so treated to stay around after it has been run. Paper is the only lining that can be used, and the paper will crush more or less under the pressure and allow the bearing to squeeze out of shape. For this reason the only way a crankpin bearing can be refitted without replacing the worn brass is to close in the cap to make the bearing round, and then to scrape the brass as true as possible. This is a short operation after the parts are removed, and requires little skill.

THE READERS' CLEARING HOUSE

TIMING THE ENGINE

New York—Editor Motor Age—While we agree with you that it is difficult to establish a hard and fast rule regarding the timing of an engine, we feel it is necessary to enter a protest against the statement you make in answer to a correspondent on page 17 of your issue of August 31 that the exhaust valve "should close at dead top of the exhaust stroke." This would have been correct in the days of low speed engines, but modern practice finds it necessary to take into consideration the inertia of the exhausting gases. The quick up-stroke of the piston gives the gas an impetus that lasts after the exhaust stroke has been completed and the next stroke begun, and to close the exhaust valve against gases struggling to escape is to weaken the incoming mixture. The inertia of gases applies as strongly to the cylinder as it does to the carburetor, and must be reckoned with. The exact closing point can only be determined by experiment, but in general it may be said that the exhaust valve closes when the piston has completed from 5 per cent to 8 per cent of its down stroke, the inlet valve opening at the same time. The same law applies to the closing of the inlet valve, which should not occur until the piston has traveled about the same distance on the compression stroke. Through its inertia, the gas will continue to enter the cylinder after the beginning of the compression stroke, and to close the inlet valve before the pressures inside and outside of the cylinder are equalized

is to lose a corresponding amount of power. These statements naturally apply only to high-speed engines, such as are used on automobile work, and not to stationary plants or necessarily to marine engines. The point is not recognized by all manufacturers, but we have observed many cases where the power of an engine has been materially increased by following the natural law of inertia.—R. B. Whitman, technical director New York School of Automobile Engineering.

CONDENSER SCORCHING

Eldorado, Ia.—Editor Motor Age—I read your communication from H. H. Franklin Mfg. Co. headed "System of Education Needed in Iowa," and want to enter my objection to the stand taken by these people. I am an automobilist myself, having run a car for more than 3 years and now have two, but if anyone can tell me wherein motorists profit any by these exhibitions of lunacy, wherein they try to run at such great speed on our country roads not made for racing, or safe for either the foolish racers or the public which may be traveling thereon at the same time these law-breakers come along. The facts are that such exhibitions only tend to create a greater dislike for all of us who derive great pleasure in sane motoring by the

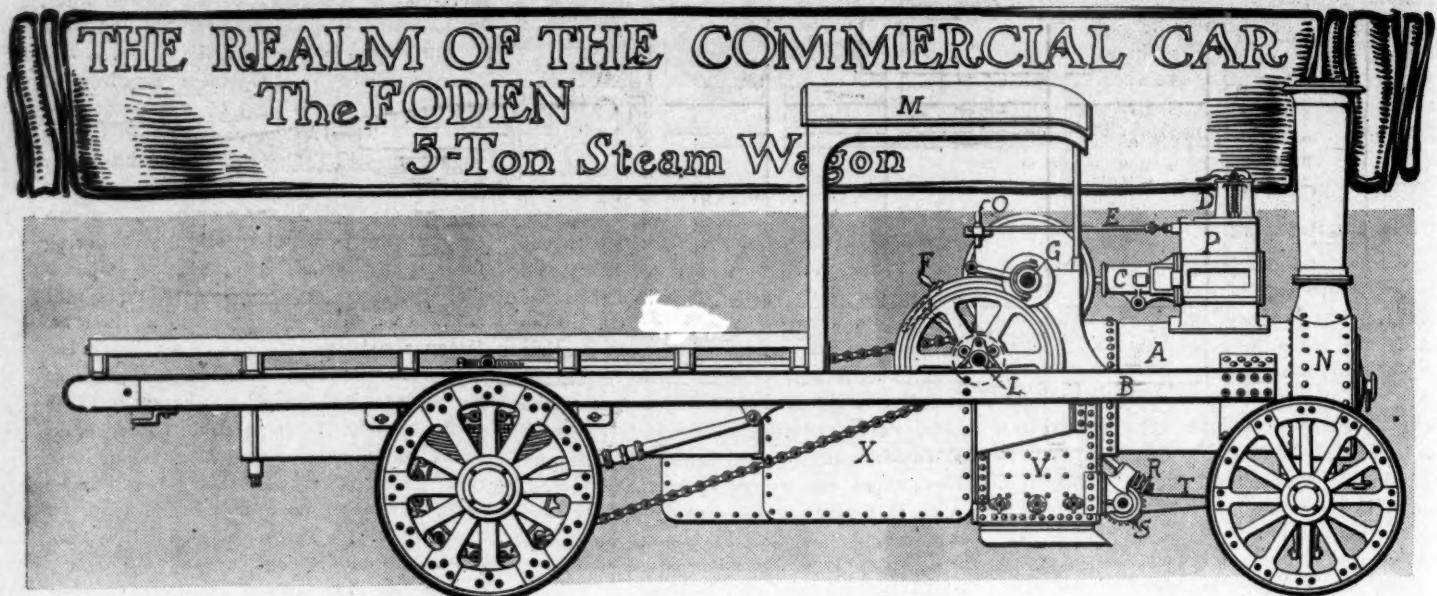
average horse driving public, and I only hope more Iowa justices will in the future make it so uncomfortable for the speedsters that without special preparations being made no more such foolishness will be possible. Iowa is all right.—C. E. Greif.

NOT EXACTLY NEW

Grinnell, Ia.—Editor Motor Age—A party has made inquiry of us in regard to the commercial value and salability of a contrivance which would give the profile of the roads between two points—for instance, between Chicago and New York. He has three or four routes showing the grades, and by attachment to his motor car it will show 2½ miles in advance of where the traveler might be when he glances at his dial. These we figured on by putting on a roller as kodak films and by taking them in the hands at any time and unrolling, it would show the road conditions for a long distance ahead. We would ask if this contrivance would have any commercial value.—Grinnell Garage Co.

This is not entirely new; in fact, a similar device was used in experimental work in England, but its use was so limited that it never proved a success. The cost of making the rolls would appear to be against it as a commercial proposition. With the increase of motor power, as compared with car weight, the exact grade and length of hills have lost much of their former terror and now the touring motorists realize that even if behind schedule his car is equal to all emergencies and hills.





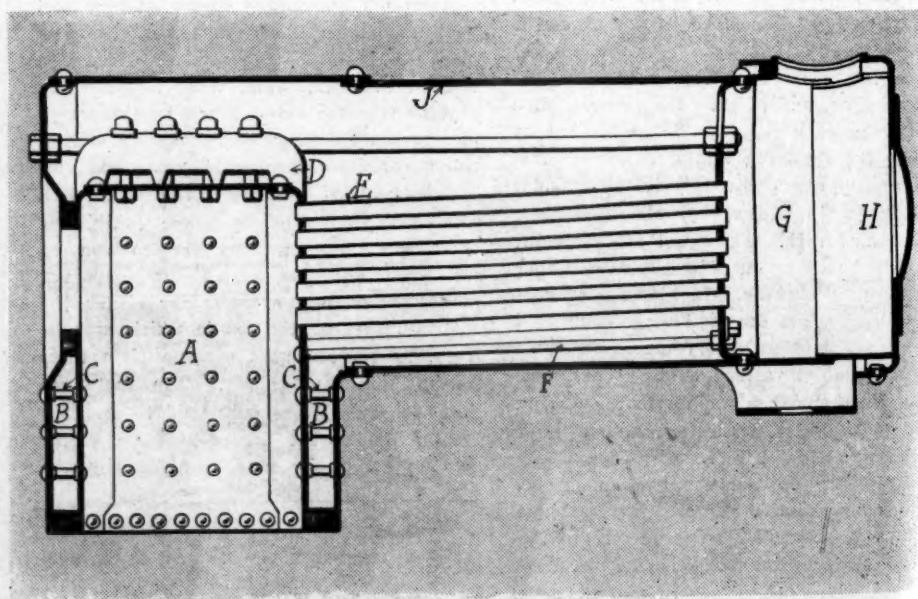
SIDE VIEW OF FODEN 5-TON STEAM TRUCK, WITH HORIZONTAL LOCOMOTIVE BOILER

THREE weeks ago, August 16, attention was drawn in these columns to the rapid gain in popularity in England of the steam motor truck, or lorry, as generally termed there. On that occasion a description of the slow-operating Sentinel engine was included, the feature of the Sentinel engine being a very long stroke and the absence of any change-speed gearing between the motor crankshaft and the back wheels. This slow movement is particularly attractive in steam machines, in that it is so closely associated with longevity and small repairs. All steam trucks are not, however, fitted with such slowly-reciprocating engines as the Sentinel, and this week attention is drawn to the Foden, a wagon that has for 6 years been performing service in all parts of the country. The Foden has been closely allied with progress ever since its inception, and a review of its details is equivalent to a study of one phase of the steam road wagon abroad.

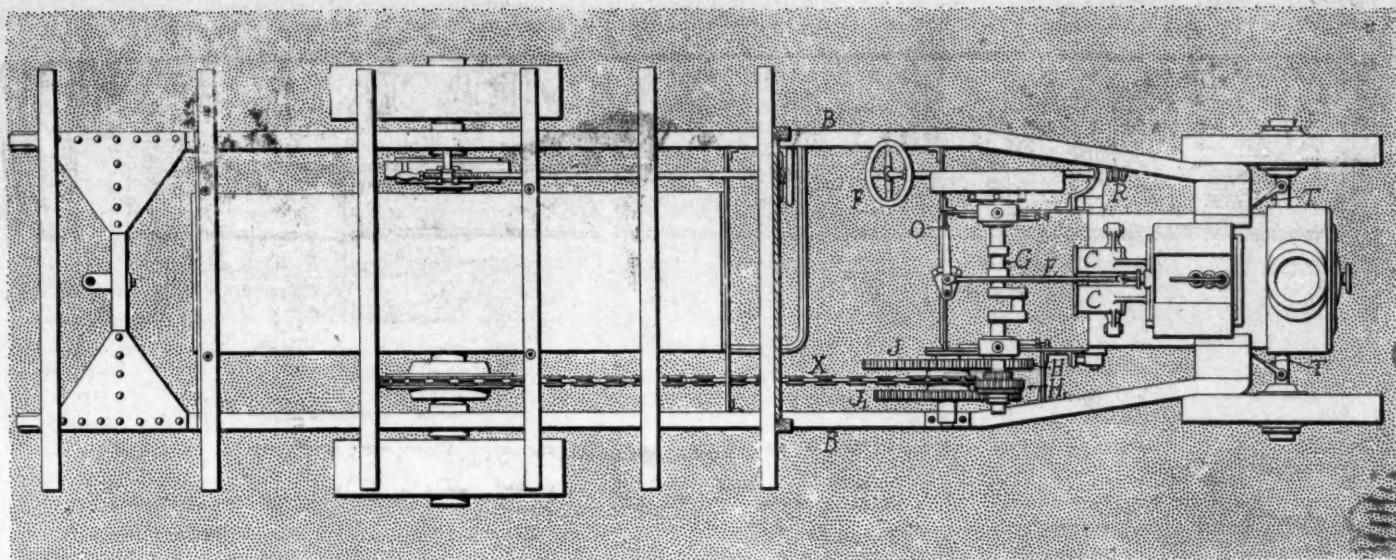
The Foden wagon, from the factory of Messrs. Foden, Limited, Elsworth works, Sandbach, Eng., is representative of that type of steam wagon in which a locomotive style of boiler is used. By locomotive type is meant a boiler in all intents and purposes of similar design to that used on railroad locomotives. Besides being representative of this class the Foden stands as a good representative of those machines in which a two-speed gearing is inserted between the motor crankshaft and the live rear axle—a little of gasoline automobile construction permitting of the operation of the engine at a standard speed and yet having the vehicle travel at 3 or 6 miles per hour, as the low or high speeds are used. Many steam vehicles abroad use transmission gears, which are practically essential owing to the adoption of high speed engines, those which operate at a crankshaft speed of 500 revolutions per minute. From the countershaft of the

transmission the Foden has its power communicated by a single chain to a differential located near the right end of the back axle. To American readers the using of a live back axle will appear a weakness in these machines, but such misconceptions readily vanish when reminded that the Foden's back axle is a solid nickel steel bar $4\frac{1}{2}$ inches in diameter, which couples from wheel to wheel and is surrounded by a steel sleeve on which is mounted one of the differential wheels, and by which the right drive wheel of the wagon is propelled, the left drive wheel being driven direct from the differential through the solid axle. In fact, the reader will discover in the Foden wagon, in particular, that it is built on the robust order, the maker preferring a few hundred extra pounds weight to broken parts. Lastly, in this general resume of this typical English wagon, it must be noted that the steering

is not on the Ackermann principle, through a stationary front axle with steering knuckles on the ends, rather, the common traction engine scheme rules, in which the axle is swivelled at its center as is the axle in a horse-drawn vehicle. In turning the wheels recourse is had to a slanting steering column with a hand wheel—automobile fashion—coupling through a worm and sector steering gear, the sector being on a horizontal cross shaft beneath the body. This shaft carries a couple of chains, connecting with the ends of the front axles, so disposed that when the shaft is revolved in one direction through the agency of the steering gear, one chain is wound and the other unwound, thus turning the axle in one direction; with an opposite movement of the steering wheel a directly opposite action in these two chains is obtained, followed, of course, by an opposite turn



HORIZONTAL SECTION OF FODEN STEAM BOILER



PLAIN VIEW OF THE FODEN 5-TON STEAM TRUCK

of the front axle. Added to these characteristic features is that of carrying the two-cylinder engine on top of the boiler—very accessibly—instead of beneath the load platform of the truck.

A complete analysis of the Foden is facilitated by reference to a side view and plan section, shown herewith. For those not familiar with steam machines—it must be remembered steam trucks are very rare in America and few Motor Age readers are steam engineers—a calling of attention to the many parts revealed in these two illustrations will prove beneficial before looking into the details of the boiler and engine. In the side view A marks the boiler barrel within which are the fire tubes and the boiler space; the main frame pieces B support the load platform and carry the boiler and engine; both the low and high pressure cylinders C find support on the top of the boiler through a heavy bracket secured thereto. In front of them

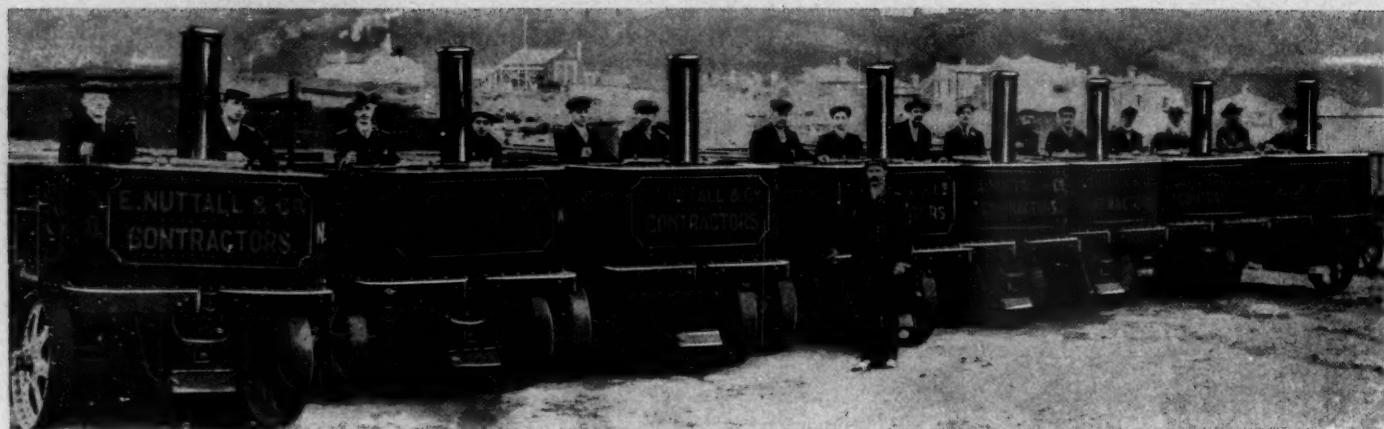
is the valve chest P, the valve action in which regulates the passage of steam to the cylinders, it being possible to let hot steam into the high pressure cylinder first; then the exhausted steam of this cylinder passes into the low pressure cylinder, or when great power is required admits high pressure steam into both cylinders, thus simplifying the engine; the safety valve D permits steam to blow off when the pressure within the boiler exceeds a certain predetermined limit; from the throttle lever O a connecting rod E, termed the main throttle rod, is the connecting link for controlling the valve actuation; in front of the boiler a cylindrical chamber N, termed the smoke box, receives all of the smoke which passes through the fire tubes and delivers it to the smokestack directly above it; F marks the steering wheel with the worm R on its lower end meshing with a sector S on a cross shaft, and from this cross shaft the steering chains T con-

nect with the right and left ends of the front axle; G points out the end of the crankshaft and the double circle around it indicates the flywheel; L similarly shows the end of the countershaft of the change speed gearset, and from this shaft the chain X transmits the power to the differential on the back axle; a radius rod on each side assists in adjusting the drive chain X; V indicates the firebox beneath the rear end of the boiler; and M, the canopy cab for protecting the driver. Continuing this analysis in the plan section of the Foden chassis, a better view of the crankshaft G is obtained with its two crankthrows set at 90 degrees to each other, instead of at 180 degrees, as common in gasoline motors with two cylinders; to the front of it, lying side by side, are the two cylinders C for high and low pressure, one with a 4-inch bore, the other with a 6½-inch bore, and both with a stroke 7½ inches long; the countershaft also appears more advantageously with its change-speed gear system giving low speed, 3 miles per hour, when pinion H on the crankshaft meshes with gear J on the countershaft, and high speed when gears H1 and J1 are meshed, the drive from the countershaft being from the sprocket, seen between gears J and J1, and thence by chain X.

The Foden boiler, shown elsewhere, has fifty horizontal fire tubes, each with a diameter of 1¾ inches. These fire tubes extend from the firebox A, at the rear where the heat is generated, to the smoke box G, at the front, from which the smoke escapes by the smoke stack. In the space surrounding these tubes and among them is the water, which also partially fills the space above the top row of tubes, the general water level being indicated by the medium horizontal line, the level on ascending and descending hills appearing by the sloping lines. Up to the present season much criticism has been aimed at the locomotive type of boiler on this water level



LATEST MODEL OF THE FODEN 5-TON WAGON



FLEET OF LEYLAND STEAM WAGONS USED IN STREET CONSTRUCTION WORK IN CAPE TOWN

problem, the critics maintaining that on ascending a hill the water fails to cover the front ends of the fire tubes, that burning out of the tubes or an explosion may result, and that in descending a grade the crown or top of the firebox is similarly not covered with water. The sloping lines indicate the water level when on a hill of one in seven, or 15 per cent, at which time the crown of the firebox and the forward ends of the tubes are totally submerged. In getting away from the difficulty of the water level the vertical boiler has come into considerable repute, as has also the pivoted style of boiler, in which the tubes are horizontal whether ascending or descending hills.

To insure rigidity in the Foden boiler, longitudinal supports *F* give rigid connection between the firebox *A* and smokebox *G*. Other supports *C* act as reinforcers between the firebox and the outer boiler, the spaces *B* serving as water spaces around the firebox. This boiler has a working steam pressure of 200 pounds per square inch, and a nice point about it is that the exhaust steam, instead of passing into the smokestack and being emitted in clouds, is passed through a superheater in the smokebox, which raises its temperature, and it passes invisibly out of the smokestack. This is important in city streets particularly, as regulations against the emission of smoke or steam are unpardonably stringent. The boiler support on the main frame includes a couple of brackets at the front, one at each side, and thin steel plates at the rear, so that any expansion or contraction of the boiler does not affect the running gear or working parts, the steel plates affording the firebox end of the boiler a slight movement. The firebox will take any fuel for fire purposes, but good steam coal produces the best results, it giving nearly 10 pounds of steam per pound consumed. The water tank, located to the rear, carries 150 gallons, sufficient for a 20-mile run with full load.

The running gear contains "timber" in goodly proportions. In the main frame are two

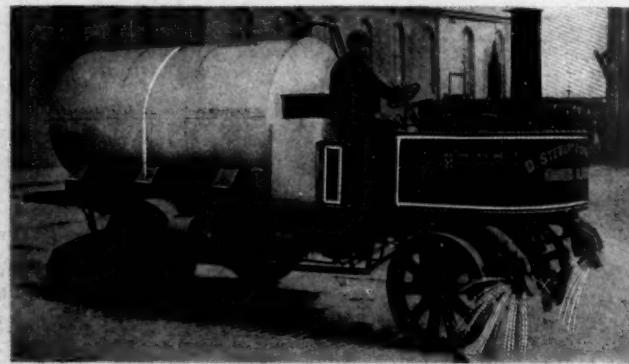
steel channel pieces bent inwards at the front end, where they take the brackets for carrying the boiler. These steel channels measure 6 inches in depth, with a 3-inch width and a uniform wall thickness of $\frac{3}{8}$ inch. They are reinforced by cross members and gusset plates, a particularly heavy piece doing service at the back. Supporting this framework at the back is a pair of semi-elliptic springs with their ends carried in pins supported in fore and aft brackets attached to the under side of the frame pieces. In front is an inverted semi-elliptic spring located directly above the axle, which at its uppermost point supports the center bracket on which the boiler swivels. The back wheels, carried well outside of the frame pieces, are 42 inches in diameter and carry 10-inch tires, while the front wheels, 33 inches in diameter, have 6-inch tires. The tread in front is 48 inches and that of the rear wheels 68 inches. The maker casts the rear wheels with T-shaped rims and cross grooves for increasing the tractive force. Previously, instead of these grooves angular pieces of steel were secured to the outside of the rim, but it was found that often the rivets or bolts holding them in position worked loose at a time when the best wearing part of the strips was contacting with the ground. It is a peculiar feature about the present wheels that the steel wears better after the wheel has been in use a few months and the edges of the grooves have been worn off. The construction of the front and rear road wheels has an important bearing on the cost of the upkeep of the machine, for it

is common knowledge that wheels not well made rapidly deteriorate and result in unnecessary expenses to the machines. In the Foden wheel the cast *T* rim and the cast hub are formed first. The spokes are inserted into the hubs and then the outer ends of them are hydraulically drilled and pressed into the rims, the spokes being disposed alternately in and out to increase the lateral driving strength.

As to the success attending the usage of Foden steam wagons in varied services, the following paragraphs from users will prove sufficient. The names of the users are withheld simply because they are located in the different cities in England and have not any local interest. Should any readers desire them they will be furnished on request:

"We have had our lorry truck for 2 years, and during that time have always found it quick, economical and sure to work. The average distance traveled by it per day is about 60 miles with 4-ton loads, and the total distance traveled per week is 350 miles. The cost of coal and of oil is very small—\$2 per day will cover all of these items. We have worked out the annual cost of the motor, without wages for drivers and other men, at \$500 for fuel and \$30 for repairs. The truck in 2 years has run 25,000 miles," is the statement of one owner who uses his wagon in various services.

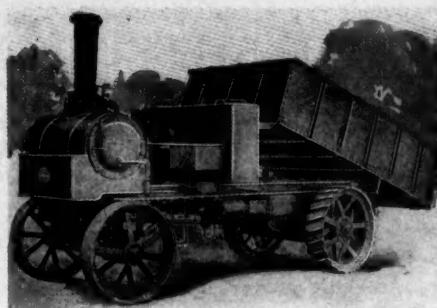
In another case a wagon from May until January made 30,000-ton miles with 16 miles per hundred weight of coal in good weather and 9 miles per hundred weight in bad periods. The truck displaced seven horses, traveled 30 to 60 miles per day, and made long journeys with heavy loads which were impossible with horses. A third user of Foden wagons mentions having bought a second-hand one for \$1,600, it having seen 6 months' service. The first year the truck was used on poor roads in the stone business, the good roads not leading into the quarry sections. It made trips of 35 miles each day, taking a load one way and re-



STEWART'S ROAD SWEeper AND SPRINKLING CART

turning empty. The expense for the year was 69 tons of coal for fuel, \$335; oil, \$65; replacements, \$300. A fourth party, using a 5-ton Foden wagon, replaces seven horses by it where single journeys are made each day, and fourteen horses where double journeys are made. It is often possible to make the double journeys, they being in order three times a week, but with a team of horses a double journey is out of the question. The truck makes 500 miles per month. Still another mention is made of using one of this make of wagons for nearly 2 years in the contracting and bricklaying business, and that at the start between February 1 and the following December 30 it made 1,028 journeys with a total mileage of 7,000. For this period the cost of operation was: Coke, \$100; oil, \$60; wages, insurance and other expenses, \$600. This truck makes long journeys in delivering bricks that could not be made with horse teams. To cite one more example of what this wagon has done, one owner of 18 months has lost but half a day through a stop of the wagon, and that was owing to a bushing breaking.

The actual cost of operating steam wagons of various sizes from that carrying a 5-ton load to the less pretentious 2½-ton wagon is well evinced from the experiences of an English brewing firm that has based its calculations on a period of 6 years, all of which time it has had its steam wagons in continual operation. Three of the wagons owned by this concern have their running cost summed up by the firm in hundred-weight miles, this unit meaning the cost of carrying 112 pounds 1 mile. The English hundred weight is 12 pounds in excess of the American standard. After keeping careful account of the working of forty-two horses for a period of 4 years it was found that a horse would average 150 hundred-weight miles a day, or 900 hundred-weight miles a week. In this calculation only paying load is reckoned and no account is taken of the "returned empties" which both horses and motors bring back. The 5-ton steam wagon made



YORKSHIRE 5-TON TIPPING WAGON

6,314 hundred-weight miles in 6 days, the 4-ton wagon 5,683 hundred-weight miles and the 2½-ton wagon 5,250 hundred-weight miles in the same time as compared with the 900 of the horse. It must be noted in this connection that the 4 and 5-ton wagons when loaded to their fullest capacity, instead of doing the work of seven horses, would equal the efforts of ten equines. Moreover, the 4-ton wagon worked but 5 days a week and the 2½-ton machine was handicapped with a short route on Saturdays. In the question of cost of operation the figures given later are those applying to the three steam wagons referred to. The fuel bill will in the future be still further reduced, as the firm has contracted for coke at \$2.25 per ton.

COST OF 6 DAYS WITH 5-TON WAGON	
Driver at \$1.25 per day.....	\$ 7.50
Assistant, \$1 per day.....	6.00
Fuel, 1 1-5 ton coke at \$4.....	4.80
Two pints cylinder oil.....	.25
Four pints engine oil.....	.22
One-half pint bath oil.....	.07
Total	\$18.84

COST OF 5 DAYS WITH 4-TON WAGON	
One driver at \$1.25 per day.....	\$ 7.50
Assistant at \$1 per day.....	6.00
One and one-fifth tons of coke.....	4.80
Two pints cylinder oil.....	.25
Four pints engine oil.....	.22
Two pints bath oil.....	.09
Two pounds grease.....	.10
Total	\$18.85

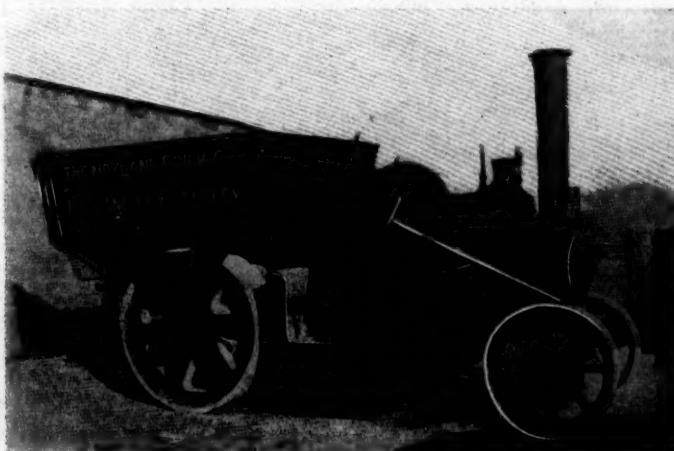
COST OF 6 DAYS WITH 2½-TON WAGON	
One driver	\$ 7.50
One assistant	6.00
One and one-twentieth ton coke.....	4.20
One pint cylinder oil.....	.12
One pint engine oil.....	.05
Three gallons bath oil.....	1.12
Total	\$18.99

Coal and coke, owing to their abundance

throughout England, form the chief fuel for all styles of steam motor wagons. In all localities in the center and north of the country a cheap grade of fuel is plentiful, but observation has it that the better grades are in the end more economical, as they produce more heat, soot the fire tubes less and so require less cleaning. In the cleaning process it is the custom in England to clean up every Saturday afternoon, or, if that is a busy day, any other afternoon during the week. Tests have shown that the wagon well looked after each week gives much more satisfactory service, pulling heavier loads and making faster speeds.

UNCLE SAM BUILDING CARS?

In connection with the recent tests made by authority of the postoffice department to demonstrate the adaptability of automobiles for the use of rural carriers in serving their routes, statements have appeared that the department has had constructed a car especially adapted to this work, and that, if the experimental cars prove successful, it will supply them as fast as possible to all carriers. This has had the effect of swamping the department with requests from the thousands of rural carriers throughout the country for automobiles in which to serve their respective routes, and has caused the postal officials much annoyance. As a matter of fact, as pointed out in Motor Age, the automobile used in the tests was not constructed by the department, but was made by the Waltham Mfg. Co., which made the tests under the supervision of an official of the post office department. As further pointed out in Motor Age, and now reiterated by Fourth Assistant Postmaster General DeGraw with all positiveness, the department will permit rural carriers to use automobiles in serving their routes in those sections where the topography of the country and the character and condition of the roads render their use practicable at all seasons of the year, but the department does not intend to furnish automobiles to rural carriers. Carriers who desire to use cars must provide them at their own expense.



MANN CART USED FOR SHORT HAULS



EARLY TYPE OF MANN STEAM CART

COMMERCIAL STEPPING STONES

Invades New Hampshire—B. H. Lamont, who has operated an automobile livery at Ormond, Fla., is to have a similar concern at Bretton Woods, N. H., during the season.

Making Money in Paris—The new Paris motor buses give an average receipt of \$40 per day, against \$16 per day given by the old line of horse buses, and this has greatly encouraged the promoters.

Knox Agent—Fred H. Adams, 541 Tremont street, Boston, has been made agent for the Atlas gasoline trucks and commercial cars manufactured by the Knox Motor Truck Co., Springfield, Mass.

Long Test—A trial trip around France was made recently by one of the new Darracq-Serpollet steam buses, which did the 2,500 miles in 15 days. The entire trip was made without accident and as an extra stunt the bus made a non-engine stop run of 274 miles in 19 hours.

Pittsburg Roused Up—Postmaster W. H. Davis, of Pittsburg, is trying hard to get automobiles for delivering the city mails. He has succeeded in getting an inspector appointed who will make a thorough investigation and if his report is favorable a formal request to the authorities at Washington will be made soon. Postmaster Davis figures that the cost of delivering and collecting the mails could be greatly reduced and also that the trips would be more regular.

Now Use Four Buses—The Lewis Point and Central New York Automobile Co. has started its automobile or omnibus service from Canastota, N. Y., to Lewis Point, on Oneida Lake. Four automobile buses have been purchased and cars will be kept for private parties. The round trip is now made in 1 hour. Fifty cents is charged for one way and 75 cents both ways. Lewis Point has become a well-known summer resort and the automobile company expects to do a large business throughout the season.

New Rubberneck Car—The Toledo Touring Car Co., of Toledo, O., has set its first rubberneck touring car at making regular sight-seeing trips about the city. It is the first of the kind in that city. Three trips have been planned, all to start from the business part of the city, in the hotel section of the town, the times for leaving being 10 a. m., 2 p. m. and 4 p. m. It is expected that during the three trips the car will touch many of the most interesting points in the city, as one trip will be made through the manufacturing sections, another through the residence sections, another to the resorts. Only one car will

be operated this season, but during next winter a number of other cars of the rubberneck type will be manufactured. The new car carries twenty passengers.

Uses Motor-driven Mower—Appreciating the fact that this is an age for motors, the members of the Park Club of Buffalo have decided to be up to the minute and have bought a new motor-driven mower, which is doing all asked of it.

Pittsburg Tries It—Kaufmann Brothers' immense department store in Pittsburg has received a consignment of eight trucks. They are 24 horsepower and adapted to the heavy loads and the steep grades of Pittsburg. If successful more cars will be ordered soon to take the place of all the Kaufmann delivery horses.

Net Profit, \$1,500—The first motor bus balance sheet in England has appeared in the shape of the Midland Motor Bus Co., which has been working in Birmingham for about a year. The revenue of the company for the 12 months exceeded \$240,000 and the net profit after setting aside necessary reserves is given as about \$1,500.

Chance in Greece—Although up to the present time automobiles have been little introduced into Greece, the country appears to offer a fair market for them. Not only would they be taken up by private people, but there is no doubt that the shopkeepers in Athens would adopt them in their business. Some of the public roads being kept in excellent condition, there is also scope for motor omnibus services to compete with horse-drawn vehicles. A friend of the Grecian ministry obtained some time ago the monopoly of public automobiles for the whole of Greece, but as he has done nothing in the matter, the concession has fallen through, and the present would be an opportune time for American manufacturers of commercial cars to endeavor to establish a trade in Greece. The increase in the import duties has been a reason for retarding the development of the automobile trade of Greece. The duty was formerly 20 per cent ad valorem, but at the present time, pending a

revision of the general tariff, automobiles have to pay a provisional duty of about \$140 each, which includes municipal and port dues.

Brewer Uses Truck—John Stabich, a prominent brewer of Johnstown, Pa., has adopted the automobile truck entirely for delivery purposes.

Fine Field in Australia—It is reported there is an unlimited field in Australia for automobiles suitable for agricultural or mining purposes, the latter being required for conveying fuel to and ore from the various mines, especially in northern Queensland, where the traction engine is getting a good foothold. A demand is also springing up in the country districts for motor vehicles constructed to carry both goods and passengers, as a means of communication between railway stations and river ports and inland townships. There is money to be made in this direction, but the work will be uphill at first, it is expected.

Flourishing in Italy—The motor car industry in Milan, Italy, has become very important and is in a flourishing condition. New plants have been constructed or are in course of construction, companies have been formed, and hundreds of cars and motor cycles are in use, besides a fair number of motor cabs, vans, buses and lorries. Many cars are still imported, and there might possibly be a market for others and for heavy vans or lorries. Naturally competition is keen and must be met in the usual way. The best way to test the market would be to exhibit at Milan or Turin at the annual automobile shows, which are generally held in the spring.

Farmers Wake Up—Farmers near Lockport, N. Y., are realizing that this is the motor age. In order to facilitate the transportation of a big load of berries from the Hiram McCullam farm, east of Lockport, to a Buffalo market, one of the big machines of a motor truck company was recently secured. Wagons drawn by horses have always been used for the purpose and all night was required to

make the trip from Lockport to Buffalo. The better part of the next day was consumed in the return. Two teams of horses were used. The motor truck trip was made in less than 3 hours and a load was taken equivalent to twice that which any team of horses could draw. Should the motor truck be placed in the business of marketing Niagara county fruit, in place of one trip requiring 24 hours' time several could be made between the hours of dusk and dawn. Farmers are watching the experiment with interest.



MITCHELL WORM-DRIVE DELIVERY WAGON

GLIDDEN COMMERCIAL ECHO

America has yet to witness the introduction of the motor wagon into the rural community. England, France and Germany have carried off premier honors in rural motor work. In these lands market gardeners living from 15 to 20 miles from the city market use the motor truck for conveying the products of the ground to the buyer, the motor making trips to the market and return the same day, while with horse wagons a day is needed in the trip to the market and another for returning, thus necessitating the expense of keeping the horses and driver over night in the city. America last year in the Glidden tour received its first example of what American-built trucks can do on country roads, and this season the Knox truck, which acted as baggage escort to the Glidden tourists from Buffalo to Bretton Woods, affords another striking example of the adaptability of these wagons for country service over the worst roads possible. Readers will be interested in the following synopsis of the Knox trip, showing its daily mileage, fuel and oil consumed and time needed. The truck's capacity of 3,000 pounds was frequently exceeded by several hundred weight on several days, and at other times the load was far short of the limit. Trunks and suitcases of the tourists comprised the load. As an introduction to the Glidden run the truck made the trip from Springfield, Mass., to Buffalo on the following schedule:

July 5—Springfield to Amsterdam, 141 miles; left 8:15 a. m., arrived 9:30 p. m.; elapsed time, 11 hours 20 minutes; 16 gallons gasoline, 1 gallon oil; roads good to Albany, rough to Schenectady; climbed Jacob's Ladder hill without trouble.

July 6—Amsterdam to Utica, 64 miles; left 8:10 a. m., arrived 1:25 p. m.; elapsed time, 4 hours 43 minutes; 10 gallons gasoline, 3 quarts oil; roads rough, with deep mud from Herkimer to Utica.

July 7—Utica to Auburn, 76 miles; elapsed time, 7 hours 45 minutes; left 7:12 a. m., arrived 2:35 p. m.; 11 gallons gasoline, 3½ quarts oil; fair dirt roads.

July 8—Auburn to Buffalo, 135 miles; elapsed time, 11 hours 35 minutes; left 7:20 a. m., arrived 8:35 p. m.; gasoline, 16 gallons; oil, 5 quarts; rolling dirt roads.

In Buffalo the 3 days preceding the tour, July 9, 10 and 11, were spent in demonstrating around the city. On July 9, while demonstrating, 3½ gallons of gasoline and 1 pint of oil were used. On the day following in the orphans' parade the truck went 14 miles in 1 hour 20 minutes,

using 1½ gallons gasoline and ½ pint oil. On the next day other demonstrations consumed 1½ gallons of fuel and 1 pint of oil.

The daily performances of the run in the tour to Bretton Woods follows:

July 12—Buffalo to Auburn, 135 miles; elapsed time, 12 hours 35 minutes; left 6:45 a. m., arrived 8:35 p. m.; gasoline, 16½ gallons; oil, 5 quarts.

July 13—Auburn to Utica, 76 miles; elapsed time, 6 hours 12 minutes; gasoline, 10 gallons; oil, 1 gallon; dirt roads.

July 14—Utica to Saratoga, 95 miles; 15 gallons gasoline, 1 gallon oil; rough roads, including 25 per cent grade up Schwartz hill with full load.

July 15—At Saratoga took sight-seeing parties around and Mudlarks to the lake, 20 miles; running time, 2 hours 30 minutes; 1¾ gallons gasoline, 1 pint oil; roads good.

July 16 and 17—Schedule run was from Saratoga to Elizabethtown, 100 miles on first day, and thence to Lake Champlain, 35 miles, second day. When 29 miles out of Elizabethtown at 3:42 p. m. the mountain road of rubble and shale gave way under the weight of the truck and it hung over the bank most of the night, until a trestle road was built, when it moved off on its own power and reached Hotel Champlain at 4:12 a. m.; running time from Saratoga, 12 hours 50 minutes; 13 gallons gasoline, 5 quarts oil; roads mountain passes and trails.

July 18—Hotel Champlain to Montreal, Que., 82 miles; time, 6 hours 22 minutes; gasoline, 12¾ gallons; oil, 1¼ gallons; roads sandy and rough.

July 19—Sight-seeing around Montreal; running time, 2 hours 46 minutes; gasoline, 3½ gallons; oil, 1½ pints.

July 20—Montreal to Three Rivers, 96 miles; running time, 10 hours 12 minutes; left 6:37 a. m., arrived 6:22 p. m.; gasoline, 14 gallons; oil, 3 quarts; roads sandy, with numerous 20 per cent hills, all taken with load and without assistance.

July 21—Three Rivers to Quebec, 97

miles; running time, 11 hours 7 minutes; left 6:18 a. m., arrived 5:55 p. m.; gasoline, 15 gallons; oil, 3 quarts; roads sandy and heavy.

July 22—Sight-seeing in Quebec; 1¼ gallons gasoline, 1 pint oil.

July 23—Sight-seeing in Quebec; 1¾ gallons gasoline, 1 pint oil.

July 24—Quebec to Jackman, Me., 109 miles; left 6:15 a. m. and arrived 7:20 the following morning; owing to batteries, the truck was delayed 3 miles out of Quebec until 11:30 p. m.; 16 gallons gasoline, 3 quarts oil.

July 25—Jackman to Waterville, 93 miles; left 10:12 a. m., arrived 12:32 a. m.; last 30 miles run very slowly after dark; gasoline, 11 gallons; oil, 5 pints.

July 26—Waterville to Rangeley Lake, 105 miles; running time, 13 hours 7 minutes; left 6:50 a. m., arrived 12:06 a. m.; gasoline, 12 gallons; oil, 3 quarts; roads heavy.

July 27—Resting day.

July 28—Rangeley Lake to Bretton Woods, 124 miles; running time, 14 hours 54 minutes; left 3 p. m., arrived 3:20 p. m.; gasoline, 19 gallons; oil, 3½ quarts; roads good, with hills; took Cherry hill with full load without assistance or apparent difficulty.

At the conclusion of the tour the truck left Bretton Woods July 30 and arrived at Springfield, Mass., 287 miles, on August 1; running time, 25 hours 20 minutes; gasoline, 34 gallons; oil, 11 quarts; roads wet, hilly and slippery.

As will be seen from the above schedule, the total distance covered was 2,007 miles, on a total running time of 196 hours 6 minutes. The hourly average was 10½ miles, and the total cost for gasoline and lubricating oil and the few parts necessary in replacements \$83.85, an average cost per mile of 4 1-6 cents. The following schedule tells the story in brief:

Total distance, 2,007 miles.

Total running time, 196 hours 6 minutes.

Average miles per hour, 10½.

Total gasoline used, 255¾ gallons, at 25 cents, \$63.94.

Total lubricating oil, 17½ gallons, at 25 cents, \$13.49.

Replacement, two exhaust valve springs, at 50 cents, \$1.

Replacement, on spark plug, 50 cents.

Replacement, four dry cells, at 25 cents, \$1.

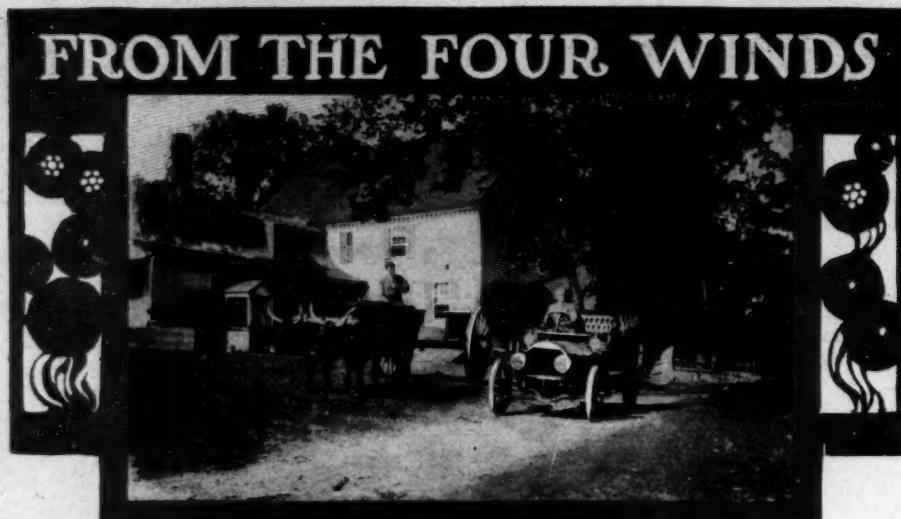
Replacement, one spring leaf, \$4.

Total, \$83.85. Average cost per mile, 4 1-6 cents.

The truck is of Knox standard, two-cylinder, air-cooled design, rated at 16-20 horsepower, with cylinders measuring 5 by 7 inches in bore and stroke. The drive from the engine is through planetary gearset and thence by chain to jackshaft, and finally by side chains to the rear wheels.



THE 1½-TON KNOX GLIDDEN TRUCK



PAST AND PRESENT AS ILLUSTRATED BY GEORGE B. SELDEN AT HADLYNE, CONN.

Past and Present—George B. Selden, of Selden patent fame, recently visited his old home in Hadlyne, Conn., the result being an interesting photograph showing the difference in transportation between the present and the past.

Another Strict Ordinance—At Port Clinton, O., automobilists will be required to observe a new ordinance, which the city dads passed recently. Drivers will be required to slow down to 6 miles an hour, and Mayor Tadsen declares that the new law will be enforced to the letter.

Show At a Fair—The Indiana state fair, which opens at Indianapolis September 10 will devote considerable of its exhibiting space this year to a display of automobiles. Probably 150 cars will be shown. Heretofore the majority of the space has been given over to carriages and farm implements, but the fair management, recognizing the importance of the automobile, has made arrangements for an exhibit in keeping with its importance.

Wideawake Commissioners—The county commissioners of Marion county, Indiana, have asked for an appropriation of \$3,000 for the purchase of an automobile. The automobile will be used in inspecting and viewing roads and it is figured will save its cost in livery bills each year. Marion county has about 1,000 miles of roads, at least half of which must be inspected each year. The county surveyor has been using an automobile in his work for the last 2 years and likes it.

Tours 3,000 Miles—J. F. Zahm, of Toledo, O., last week returned from a tour of nearly 3,000 miles through the east. Mr. Zahm was accompanied by his wife, a maid and a chauffeur, the tour being made in a Packard. From Toledo the party went to Cleveland, Buffalo, Rochester, Syracuse, Utica, Albany to New York, then over to Long Island, where a week was spent in touring the island, then back to New York, whence the party took up through the New England states, then back to Boston and New York over the

"Joyland" route, then along the New Jersey coast, spending 5 days at the latter place, then going to Philadelphia, then Pittsburgh.

Why?—Curious Philadelphia automobilists are wondering why the city's motorcycle "cops" are allowed to travel up and down Broad street displaying but one tag—that issued by the city—while they are compelled to exhibit both city and state tags or suffer arrest.

Lion and Lamb Act—A treaty of peace, apparently, has been signed between Indianapolis police and automobile owners. There have been no arrests for failure to take out the annual city automobile license this year and with the exception of a few arrests a few months ago there have been no arrests for speed violations. Another notable feature is that there has not been a serious automobile accident in the city during the season.

Climbs Alps—Lieutenant Humbert Emanuele, of the Italian engineer corps, has established an Alpine automobiling record by ascending Mont Chaberton, in the Cottian Alps of Upper Piedmont, reaching a height of 10,254 feet, and covering a distance of 11 miles, which included seventy-two turnings and an up grade of from 20 to 22 per cent. The colonel of the same engineer regiment was also in the car. Last year Prince Ruspoli and General Durand de la Penne, in a 16-horsepower car, made an unsuccessful attempt to accomplish the same ascent.

Big Mileage In Electric—F. A. Babcock, Jr., and Walter Winchester, of the Babcock Electric Carriage Co., Buffalo, drove one of the Babcock electric cars from Buffalo to Rochester, on one charge of the battery—a distance of 71 miles—on August 30. After charging the battery in Rochester, they returned to Buffalo, thereby duplicating the performance. By going out of their way an extra 5 miles, the return trip was 76 miles. The total mileage for the day was 147 miles, the distance being mostly ordinary country dirt roads with

many stiff hills. The trip was made for the purpose of demonstrating the great mileage ability of electrics. The car used was a regular stock model 5 Babcock, with regular motor and battery equipment.

Bans Youngsters Driving—A bill prohibiting the driving of automobiles or other motor vehicles on the streets of Nashville by persons under 18 years of age will be introduced at the next meeting of the city council of that city by Councilman J. H. Baskette.

Irish Show Announced—The Irish Automobile Club has arranged to hold an automobile show on the grounds of the Royal Dublin Society at Ballsbridge, Dublin, from January 5 to 12, 1907. All applications for information and space should be made to Walter Cawood, St. James Hall, Manchester, England, who has charge of the undertaking.

Missouri Road Race—Sanction has been asked for a 100-mile race, to be run on a 25-mile circuit out of Joplin, Mo., on September 26. To give all cars a chance and thereby secure a greater number of entries, the cars will be handicapped, under the direction of A. C. Webb. The county authorities have offered to permit the race and suspend the speed limit on the day of the race.

Asphalt Plant Opens—The asphalt repair plant, owned and operated by the city of New Orleans, was completed and thrown open for the inspection of the public last week. Automobilists of the city are rejoicing, because it means that within a year all the streets of New Orleans will be placed in first class shape; at the present time there are many pavements that are anything but comfortable for motoring. This marks the first municipal plant in the history of the Crescent city.

Used by Signal Corps—An important feature of maneuvering at Camp Tacoma, at Tacoma, Wash., is the car specially constructed for the signal corps department. This is a Cadillac, and the suggestion for the style first came from General A. W. Greely, commander-in-chief of the Pacific division. A great deal of interest is being taken in the operation of the car, and at the conclusion of the maneuvers in October General Frederick Funston will submit a report dealing with the adaptability of the car for maneuver and war purposes.

New Danger—Motorists in New Orleans are beginning to complain of the roller skating fad that has swept the Crescent City from end to end. It is not the fear that the epidemic of rollers may put automobiling in the shade but the danger of serious accident that the motorist has in mind. The skaters have monopolized all the pavements they can find, and now they are beginning to overflow on the asphalt streets. It can hardly be called an overflow, either, for there is yet plenty of room on the pavements, but things go by contraries sometimes. Not long ago an

ordinance was introduced into the city council to prohibit skating on pavements, and a howl, loud and long, arose from the knights of the little rollers. The ordinance was voted down. Now the automobile owners say the skaters should be content with the cement walks and not make the streets obstruction race courses. So far no serious accidents have occurred, but there have been several narrow escapes.

Maxwell Generosity—The Maxwell-Briscoe Motor Co. will use the 5 acres of space which has been engaged on the Jericho turnpike for its use as a parking space on the dates of the two Long Island races, and all owners of Maxwell cars will be invited to avail themselves of the accommodations afforded. As there are between 600 and 700 Maxwell owners in the city of New York and vicinity, it is expected that the park will be well filled.

French Test Ends—The automobile service between Paris and Trouville, undertaken for several Paris journals by Bousquet & Co. with a 20-horsepower Bianchi machine, is now terminated. During the 23 consecutive days on which the service has been maintained the machine has covered 7,500 miles, carrying 20,000 copies per day, or a total weight of 1,540 pounds. On this run the new Elastes principle, in conjunction with Continental tires, was employed. The result has been an absence of tire trouble of any kind.

Awards Road Bid—State Engineer Van Alstyne has opened bids in Albany, N. Y., providing for road improvements in various sections of the state, including western New York, which will involve an expenditure of about \$1,000,000. Among the bids were three from Buffalo firms for macadamizing the road from Suspension Bridge to Lewiston, N. Y., a distance of about 2½ miles. The bidders were the Good Roads Construction Co., \$23,500; Mosier & Summers, \$24,500; H. P. Burgard, \$25,200. The Good Roads Construction Co. received the contract.

Convinced the Farmer—As an illustration that the alleged unfriendly attitude of the farmer toward motorists is but a matter of misunderstanding rather than of lasting prejudice is an incident related by George C. John, who stopped in Cleveland over Sunday bound from Chicago to New York and Boston on a demonstrating trip of the new American Mors. Coming into Cleveland from Toledo, the touring party noticed one of the guide boards recently erected by Secretary Asa Goddard, of the Cleveland Automobile Club, lying on the ground near the pole to which it had been attached. The car was stopped and J. N. Dyer of the party proceeded to replace it. His work was interrupted, however, by the appearance of a farmer, who avowed that no automobile signs should be erected on his property. After a useless dispute the bucolic gentleman was invited to take an automobile ride. A fast spin down the road, a demonstration of starting and

stopping and of the efficiency of emergency brakes knocked the farmer's prejudice into a cocked hat, and he was returned to his home, where he voluntarily re-erected the despised guide board.

Kansas City Changes Date—The Kansas City Automobile Club has decided to change the date of the 100-mile endurance contest from September 12 to September 11. This was done because there will be a country fair in Spring Hill, Kan., one of the towns through which the route lies, on the 12th, and the club wants to take no chances with a large assortment of runaways.

Buffalo Doing Sign Work—Additional road signs have been shipped to the Automobile Club of Buffalo, which will be erected in Erie and Niagara counties. Before the club gets through with this work it anticipates placing direction signs at all important crossroads and danger signs at approaches to steep hills and dangerous railroad crossings within a radius of 50 miles of Buffalo. Secretary D. H. Lewis expects to have fifty new signs erected within the next 2 weeks.

Convicts for Roadwork—Representative Curtis, of Kansas, proposes to introduce a bill at the next session of congress to have a macadamized pike built from Fort Leavenworth, Kan., the largest army post in the United States, to Fort Riley, Kan., a distance of 143 miles. The plan is to have the work done by convicts in the federal prison in Fort Leavenworth. The new prison there was built almost entirely by convict labor. The construction of a road between the two posts would bring them a day or two closer in the matter of transportation overland, a great deal of which now has to be done by rail, on account of the poor condition of the roads. Big maneuvers are held annually at Fort Riley, to which troops march from Fort Leavenworth. In addition Mr. Curtis

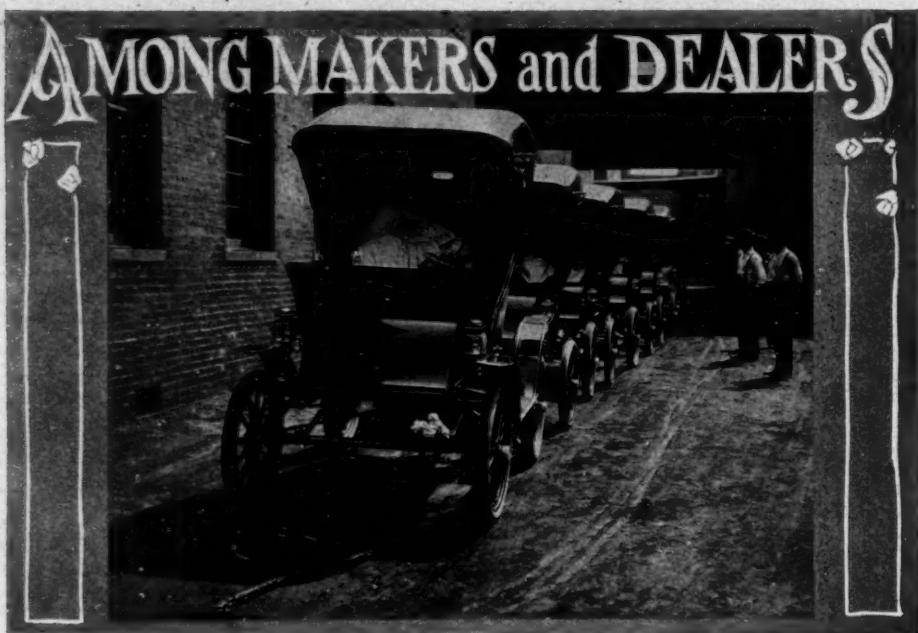
argues that such a road would be of great benefit to the entire territory through which it passes and would serve as a model in the building of roads by both state and counties.

Economy Test Certain—The New York Motor Club will not abandon its second annual economy test after all. The contest and technical committees decided not to let drop the economy test of the club, which was to have been held last week, but which was not started on account of the fact that manufacturers and agents are engrossed with preparations for the Vanderbilt races and the getting out of 1907 models. The allied committees decided to hold the test 'on or about November 1, believing that an autumn contest following the very complete rules already compiled will appeal to a great many trade interests. A recommendation to that effect was made to the directors of the club by the two committees.

In Earnest—The automobile owners of Seattle will join issues with the King County Good Roads Association in its fight on the county commission. The association at a recent meeting decided to put up its own candidates for the commission, and in this movement the automobile owners concur. The meeting was characterized throughout by earnest discussion. Charges were freely made that the commission had broken faith with the association and violated promises to make certain specified expenditures on the roads. After considering the matter in all its phases the following committee was appointed to choose candidates to represent the good roads movement at the coming election: Judge J. B. Flenner, Thomas Duncan, W. P. Perrigo, N. H. Latimer, Henry Parry, Robert Bridges, W. W. Beck, D. McGuire, Will H. Parry. This committee will meet shortly to canvass the situation according to its instructions.



SIGNAL CORPS CAR USED IN ARMY MANEUVERS AT TACOMA



POPE-WAVERLEY CARS READY FOR SHIPMENT FROM INDIANAPOLIS

Nash Made Manager—A. H. Nash has been appointed manager of the National Tire Repair Co., of Philadelphia.

Peoria Plans—The Bartholomew Automobile Co., of Peoria, is making plans for the enlargement of its factory space. Whether it will build on its present site at 300 Bradley avenue or down town is not yet known. The present location is leased, and when the new lease is made, which will be in a short time, the company may conclude to build down town.

Gibson Doing Well—Cecil Gibson, proprietor of the Gibson Automobile Co., of Indianapolis, has found it necessary to double the capacity of the plant to accommodate the growing business. This new addition is just being completed and when finished will be used by the repair department. A vulcanizing department, equipped with one machine for vulcanizing and one for recovering, have been installed. The company has the agency for the Premier, Reo, Ford, Wayne and Marmon cars in Indianapolis.

Washington's Row—New York avenue, between Thirteenth and Fourteenth streets, is beginning to loom up as Washington's automobile row. Several salesrooms, garages and supply houses are now located on this block and a number of dealers are seeking locations there. A deal was put through this week whereby two old residences on this block are to be converted into automobile salesrooms. One will be occupied by the Commercial Automobile & Supply Co., agent for the Wayne and Logan. This concern is now located on Thirteenth street, and as soon as the improvements now under way are completed will move into its new location at 1313 New York avenue. The adjoining salesroom will be occupied by the Motor Car Co., a Baltimore concern, having the agency in that city and this for the Peerless and Stevens-Duryea. A. L. McCor-

mick is the local manager of the company, and the concern is now comfortably located across the street from the new location.

Morrison's Line—A. E. Morrison, late of the Morrison-Tyler Co., of Boston, has taken the agencies for the Stearns and Oldsmobile lines for the coming season.

Matheson Breaks Ground—Ground has been broken for the new garage of the Matheson company at 1620-22 Broadway, New York. It will be a six-story fireproof structure, with frontage on both Broadway and Seventh avenue. The main floor will be devoted to the sales department, and the building will be fitted with all the latest conveniences for the handling and storage of automobiles.

Opens Frisco Branch—The Diamond Motor Car Co., of Los Angeles, Cal., selling Northern cars exclusively, has increased its capital stock to \$20,000 and opened a large salesroom at 365 Fell street, San Francisco. Arrangements have been made for a new building 200 by 300 feet specially designed for garage purposes to be erected in the very near future. J. A. Thomasin is in charge of the San Francisco branch, Mr. Swan continuing as manager at the Los Angeles establishment.

Big Garage in Seattle—The Northwest Motor Co., of Seattle, Wash., is the latest automobile concern of moment on the north Pacific coast. A specially built garage has been erected at Broadway and Union street, Seattle, Wash. H. B. Rector, formerly of Columbus, O., is president and manager, and he has associated with him F. R. Caldwell, who holds the dual position of secretary and treasurer. Mr. Rector considers Seattle, in spite of its hills, as being one of the most progressive automobile cities in the United States. The new garage is of brick. In addition to the large space given over to the automobiles themselves there is additional room for sales purposes. Machinery has been in-

stalled that represents an outlay of \$3,500. The company will devote special attention to the White steamer.

Putting In Charging Plant—The Union Electric Light & Power Co., St. Louis, is erecting a new automobile charging station at Vandeventer avenue and Morgan street. The location is within a few blocks of the automobile center of the city.

Change in Kansas City—F. O'Beirne & Co., of 1737 Grand avenue, Kansas City, Mo., has purchased the business of the South Side Automobile Co., of that city, and will conduct and combine both establishments at 3313-15 Troost avenue. P. A. Pollock, who has conducted the South Side company, retires from business.

Good Move—The Aerocar people have started a movement to have fewer fancy polished parts on automobiles, and with this end in view they have put a hard, dull, oil finish on their 1907 touring runabout, even the steering post, hinges, hood front and lamp brackets being coated. Rubbing with an oily cloth makes the parts look like new.

Cleveland Agencies—The following agencies will continue the sale of the Cleveland car for the season of 1907: New York, E. B. Gallaher; Philadelphia, Diamond Motor Car Co.; Boston, Butler Motor Car Co.; Pittsburgh, Colonial Automobile Co.; Chicago and Milwaukee, Cassady-Fairbank Mfg. Co.; St. Louis, St. Louis Automobile Co.; San Francisco, J. W. Leavitt & Co. The general offices at Cleveland will handle the local trade as heretofore. The offices and sales rooms of the company will be removed about December 1 from 388-390 Erie street to the new factory at East Twelfth and Power streets.

Overland Reorganizes—The reorganization of the Overland Automobile Co., of Indianapolis, has practically been completed. Back of the new company is David M. Parry, a wealthy buggy manufacturer of Indianapolis. It is said, however, that the new company is to be backed by an almost unlimited capital and that the largest automobile factory in the state will result. The Overland was formerly manufactured by the Standard Wheel Co. until about a year ago. At that time the company decided to abandon automobile building to devote its attention entirely to wheels. For some time the automobile factory remained idle, but was finally purchased by Mr. Cox, who took over the patents, drawings and stock of the Overland, but has devoted his time chiefly since then in experimenting on a gasoline car. The present plant, it is understood, will be utilized by the new company, and the factory will not become a part of the Parry Buggy Mfg. Co.'s plant, it is believed, as has been rumored. Mr. Parry says the new company will be ready to announce its plans probably by the middle of September, when it is expected the new interests will assume active management. Mr. Cox will continue with

the new company, although in what capacity is not known. It is likely that a high-powered runabout and a four-cylinder touring car will be brought out.

Takes in More Capital—The Sid Black Automobile Co., of Cincinnati, was recently incorporated at Columbus with a capital of \$50,000. The company handles the Olds and Franklin, but felt the need of additional capital.

Removal Notice—The Hess-Bright Mfg. Co., of Philadelphia, announces its increasing business has necessitated its removal to larger quarters for the manufacture of H-B ball bearings, as well as for the shipment of its imported D. W. F. ball bearings. It is now at the northeast corner of Nineteenth and Hamilton streets.

Going to Knightstown—The Manufacturers and Merchants' Association, of Knightstown, Ind., has come to terms with the Columbia Mfg. Co. and will donate a free site and building to the automobile company as long as the plant is kept in operation. Work will be begun at once on the factory, and it will probably be completed early in September. The concern is now located in McCordsville. The name of the concern will be changed, as it now manufactures gasoline automobiles exclusively.

Strike at Pope-Toledo Plant—Just 228 men went on strike at the Toledo plant of the Pope Motor Car Co. last week because one employee was discharged, the force being from the machinist, toolmaker, grinder and die departments of the factory. Secretary H. D. Leyman, of the company, stated that the man was discharged because he was talking union among the other men and departments on the company's time. Both the company and the union are holding firm, but the strikers' places are being substituted by non-union men, so that the company is being embarrassed but very little by the strike.

Southern Business Is Fine—Automobile dealers of New Orleans are commenting on the increase in the export trade from that port by way of steamer. More power vehicles are being shipped south from the Crescent city this year than ever before, and what is more, the machines are of every variety, style and class under the sun. Especially is this export movement noticeable to the countries of South and Central America. The automobile is becoming immensely popular in the tropics. On the great coffee, tobacco, banana and rubber plantations of the South American republics the machines are used largely for business purposes, especially by the overseers and owners. It enables them to get over their plantations more rapidly and with a greater degree of comfort than on horseback. Then, of course, nearly all the large cities of these southern countries have adopted the automobile, more or less. Some few machines are being shipped to Panama, the "canal zone," but the roads in that section are yet in too chaotic a

state to admit of the general use of the automobile. Cuba and Porto Rico are nibbling, and dealers are looking for an increase in trade from this direction shortly.

Kunkle an Autogas Manager—The Autogas Co., of Pennsylvania, with a newly-opened agency at 336 North Broad street, Philadelphia, has installed J. Kunkle as manager there.

Water-Cooled Carrico Motor—The speed Changing Pulley Co., of Indianapolis, will bring out a water-cooled Carrico motor early in December in response to a demand for a motor of this type. F. D. Carrico is now designing the motor, which it is understood will have about 40 horsepower. The motor will be exhibited at the New York show for the first time. This company will exhibit its air-cooled Carrico motor and carburetor at the Chicago show.

Shipping Pope-Waverleys—An interesting feature of every automobile factory is the manner in which automobiles are shipped to various portions of the country, and to ship them safely and economically is one of the gravest problems that confronts the manufacturer. The Pope Motor Car Co., in its Waverley department at Indianapolis, seems to have solved the question to its complete satisfaction. The firm usually ships in carload lots, hence the problem at first was an unusually important one to it. For some time, however, the question has not troubled the company. Now from six to seven of the single-seated vehicles can be shipped in one car. Over each car is placed a canvas covering to protect it from the dust and dirt en route. Each vehicle is held stationary by means of strips of heavy burlap bound about the rims of the wheels at the bottom and fastened on each side to the floor with wooden cleats. The batteries are packed separately in excelsior in wooden boxes and are charged and ready to be placed in the vehicles upon reaching their desti-

nation. At that time all that remains necessary to use is to make the proper wiring connections. The cars are not knocked down and crated for shipping.

Change at Toledo Battery Plant—J. M. Skinner has purchased the interest of C. A. Byers, who recently became manager of the Toledo Storage Battery Co.'s plant, and has taken the position as manager of the concern.

Will Handle Stoddard-Daytons—There will be a change in the New York agency of the Stoddard-Dayton, beginning September 1. A. H. Whiting and associates, under a corporate title to be announced later, will be the new agents. A salesroom has been leased at 1655 Broadway, adjoining the Oldsmobile store.

Building A. B. C. Car—The Auto Buggy Mfg. Co. has perfected its models of the A. B. C. automobile and will have twenty-five machines ready for the market by September 30. The plant at 4390 Olive street will be removed to more commodious quarters, the exact location of which has not been determined. Before January 1 the company expects to have several hundred of the little machines ready for distribution. A. B. Cole, the inventor, has turned out a machine capable of attaining a speed of 20 miles an hour, driven by a two-cycle, single-cylinder, water-cooled gasoline engine. The driving power is obtained by friction disc transmission. It is transmitted from a 14-inch metal disc attached to the flywheel, through a 15-inch contact wheel to the rear wheels by means of a single chain drive. The rear axle is solid steel with a change speed device on each hub. The contact wheel is shod with fibroid possessing a remarkable degree of adhesion. The contact is regulated by moving the contact wheel forward or backward by means of a ratchet foot lever. The entire machine will weigh 700 pounds, and will carry two people.



GARAGE OF THE GIBSON-SHORT CYCLE & AUTO. CO., INDIANAPOLIS

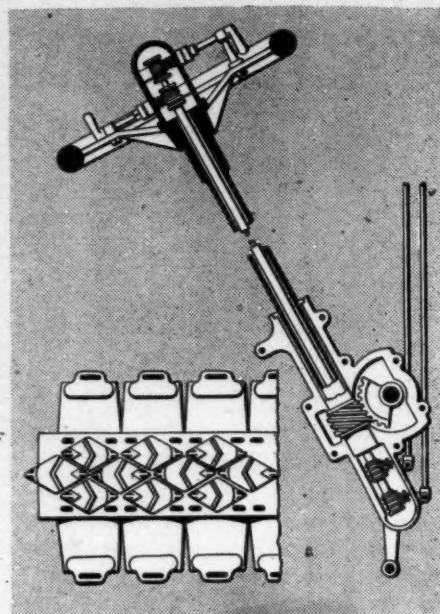
CURRENT AUTOMOBILE PATENTS

Whitlock Radiator—No. 829,625, dated August 28; to L. H. Brinkman, West Hartford, Conn. In this radiator are upper and lower water tanks and coupling these is a series of spiral pipes. In depth from front to rear the radiator is the thickness of two rows of tubes. A feature is that the coils in these rows overlap and between the place where they overlap is a vertical metal strip attached at its upper end to the bottom of the upper water tank and at its lower end to the top of the lower tank. In the upper front corner of the top water tank is a separate chamber extending the entire length of the radiator from side to side, and leading from this smaller chamber into the large chamber is a series of restricted water openings. A water inlet pipe is located in the small chamber.

Swiss Shock Absorber—No. 829,760, dated August 28; to W. Blanc and L. Paiche, Geneva, Switzerland. The shock absorber is intended for automobiles and is of the metal friction type. A vertical piston is pivoted universally to the axle and passes through a vertical cylinder pivoted universally to the frame of the car. The friction between the piston and the cylinder is sufficient to absorb sudden jars. By means of a set screw in the side of the piston it is possible to vary the friction between the piston surface and the inside of the cylinder.

Packard Steering Wheel—No. 829,402, dated August 28; to R. Huff, Detroit, Mich. Both throttle and spark finger levers are mounted on top of the steering wheel. In connecting from these levers to the rods connecting with the carburetor and commutator two connections are placed in the steering column, one a central rod to which one of the levers is connected and the other a tube surrounding the rod to which the other is attached. To effect changes of the former the rod and tube are raised and lowered in the steering column through toothed racks on

HUFF'S STEERING CONTROL



WALLWORK'S TIRE COVER

their sides and small pinions on the ends of horizontal shafts carrying the finger levers on the steering wheel. The entire mechanism is covered by a suitable dust-proof cap covering the top of the steering wheel hub.

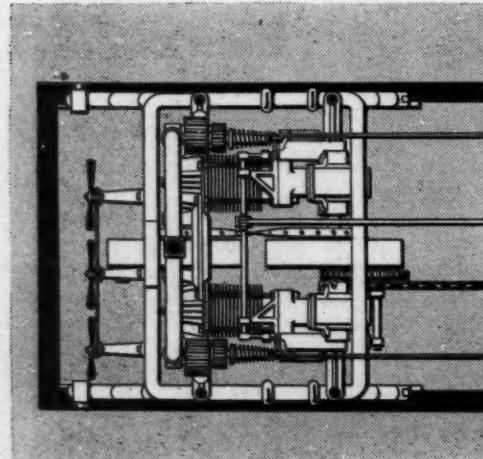
Hydraulic Clutch—No. 829,549, dated August 28; to G. Sparks, Feltham, Eng. In the illustration the flywheel is at the right and carries a conical chamber on its left in which is contained the oil or other liquid used in the clutch. In the oil chamber is a series of fan or propeller blades carried on the driven shaft or that to the gearset. On each fan blade stem is a wheel, and carried on the motor shaft is a cam for operating on these wheels and giving a part radial movement to these fans. On the driven shaft is a conical piece within the oil chamber and which is adapted to fit closely against the inner side of the conical chamber carried on the

flywheel. In engagement the spring forces these engaging surfaces partly together, and the action of the fan blades in the oil has the effect of making the engagement gradual.

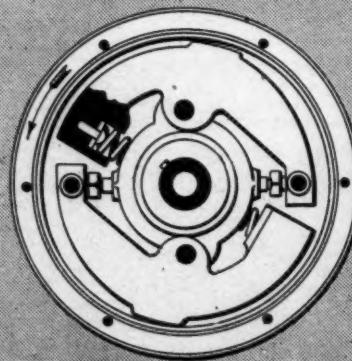
Tire Protector—No. 829,496, dated August 28; to R. Wallwork, Manchester, Eng. Covering the tread of the tire is a series of cross plates, which on their under side hug the curvature of the tire and are made wider at their center than at their ends. Holding this series together is a tread strip to which the cross plates are riveted, and carried on this tread strip and riveted thereto is a series of interlapping diamond-shaped metal pieces adapted to take hold of the ground and prevent side or circumferential slipping of the tire.

Expanding Clutch—No. 829,525, dated August 28; to W. S. Hill, Hyde Park, Mass. On the rear face of the flywheel is a peripheral flange, against the inner surface of which acts a couple of expanding members pivoted to a spider on the driven shaft. On the outer surface of each expanding member is a small friction surface mounted eccentrically with the interior surface of the flywheel flange against which it acts. The expanding action is through a cam plunger acting outwardly against one end of the members, while at the other end is a coil spring tending to keep the members well out against the flywheel surface.

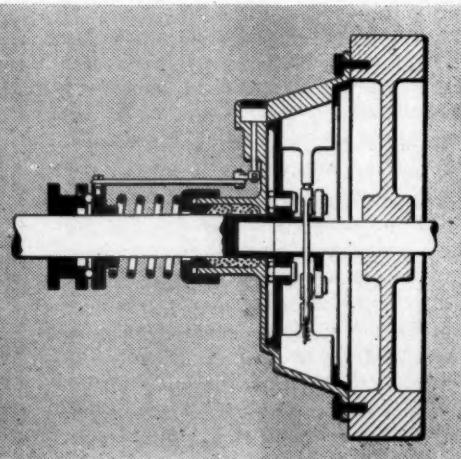
Fan Air Cooling—No. 829,599, dated August 28; to F. Patee, Indianapolis, Ind. The two horizontal air-cooled cylinders are carried side by side with the flywheel between them. Each cylinder is well supplied with cooling flanges on the cylinder walls, heads and valve ports, and to lend additional cooling three fans are mounted on horizontal shafts near the cylinder heads, so that their air currents strike the heads of the cylinders. The center fan is driven by shaft and bevel gear, and the remaining two are chain driven.



PATEE'S COOLING SYSTEM



HILL'S EXPANDING CLUTCH



SPARKS' HYDRAULIC CLUTCH

BRIEF BUSINESS ANNOUNCEMENTS

Detroit—The Buick factory will conduct a branch business west of this city.

New York—The McLean Auto Co. is occupying its new quarters at 1604-1606 Broadway.

Pontiac, Mich.—R. F. Monroe has established an automobile garage on West Huron street.

Rochester, N. Y.—An effort is being made here to organize a company for the manufacture of non-puncturable automobile tires.

Cincinnati—The Aerocar company has established an agency at 227 East Fourth street. Joseph T. Monfort will be in charge.

Brooklyn—The Williamsburg Auto & Construction Co., of 159 Clymer street, has added some improvements to its plant. It is agent for the Autocar.

Wilmington, Del.—The Dewhurst Motor Co. has been organized to acquire and prepare for market automobiles, motor cars, etc. The capital is \$25,000.

Philadelphia—Daniel Cohen, who was connected with the Reo agency here, has sold his interest and will be sales manager of the Reo Motor Car Co.'s New York branch.

New York—Washington Heights garage has been incorporated with a capital of \$100,000. The directors are Dorman L. Ormsby, Joseph A. Adler and Thomas J. Meehan.

Columbus, O.—The Dayton Automobile Co., of Dayton, has been incorporated by John L. Baker, Edward E. Burkhardt, H. A. Tressler, A. M. Dodds and John N. Deman. The capital is \$25,000.

New York—Fickling & Co., with a capital of \$15,000, will manufacture and deal in motor vehicles. W. Irving Fickling, W. Webb Fickling and W. J. Carey, of 154 East Fifty-seventh street, are the incorporators.

Brooklyn—Ground has been broken by E. H. Bishop & Sons for a large automobile garage at Halsey street, just off Bedford avenue. It is estimated that 102 cars can be stored on the ground floor when completed. Bishop & Sons are agents for the Maxwell.

Camden, N. J.—The Wilmot Motor and Cycle Mfg. Co., of 115 Market street, has been incorporated with a capital stock of \$125,000 to manufacture automobiles, motor cycles and bicycles by C. M. Cuckman, A. S. Flowers, M. M. Garrison, of Camden, and R. K. Dix, of Atlantic City.

Flatrock, Ind.—The Flatrock Automobile Co. has been organized with Martin M. Nading president, Homer M. Wright vice-president and Bruce D. Wright secretary and treasurer. The company is to do a general repair business and handle the Wayne, Premier, Ford and National.

A garage is to be erected to cost \$2,500 on M. M. Nading's farm.

Detroit—The Jackson Automobile Co. will make its own springs, axles, engines and drop forgings.

Norwalk, Conn.—The Dikeman Mfg. Co. has established a plant for the production of tool supplies and specialties.

Augusta, Me.—The name of the Ideal Steam Auto Co., of South Berwick, has been changed to the Michell Mainland Steam Car Co.

New York—The Barnett-Jackson Co. has opened a salesroom and garage at 236 West Fifty-fourth street, which will be the depot for Chadwick and Dorris.

New York—Colonel F. H. Gay, of 111 Broadway, is making alterations on his three-story brick garage at 263 West Sixty-ninth street, to cost \$20,000.

Flint, Mich.—The new factory of Weston-Mott Co. has started operations, many old employees moving from Utica, N. Y., where the plant was formerly located.

Rochester, N. Y.—Ground has been broken for the foundation of the new factory to be built by Bownell & Trebert on Lexington avenue for the manufacture of gasoline engines at the cost of \$15,000.

San Francisco, Cal.—The Hovey-Boushey Co. has been incorporated and is building a large automobile garage at 407-09 Golden Gate avenue, near Larkin street, with salesrooms and repair shops. Special attention will be given to Pope cars. C. H. Garoutte, former justice of the supreme court; H. K. Gregory, general passenger

agent of the Santa Fe Railroad Co., C. L. Hovey and Homer Boushey are incorporators.

Columbus, O.—The Union Automobile Garage Co. has increased its capital stock from \$5,000 to \$10,000.

Hamilton, O.—The Columbia Carriage Co., to manufacture automobiles, has organized. The capital is \$50,000.

Rossville, N. M.—W. W. Pitts has bought the interest of Bert C. Smith, of Pitts & Smith, in the machine shop and automobile garage here.

Reading, Pa.—The Pennsylvania Auto Metal Body Manufacturers' Co. has been organized to deal in metal bodies for automobiles, etc. The capital is \$250,000.

Muskegon, Mich.—The Continental Motor Co. is making the third addition to its plant, where it is now turning out 1,500 motors for automobiles and motor boats.

Bath, Me.—The Bath Automobile & Gas Engine Co. has been incorporated to manufacture self-propelling vehicles. The capital is \$10,000. E. W. Hyde is president and S. R. Frye treasurer.

New York—Plans have been filed for a six-story garage to cost \$150,000 at Broadway, northwest corner Sixty-fourth street, with extension to Sixty-fifth street. Robert Goelet is named as the owner.

Boston, Mass.—The McCune Motor Co., of Springfield, has been incorporated with a capital stock of \$5,000, and will deal in automobiles. W. E. McCune is to be president and treasurer of the concern.

Bedford, Ind.—An automobile company will be established here with E. B. Thornton president, W. N. Urmey secretary and J. N. Stron superintendent. It proposes to manufacture a light gasoline runabout to be known as the Bedford.

Marion, Ind.—R. A. Creek, of Newcastle, is interested in locating an automobile factory here, and believes that the railroad facilities are excellent. A meeting of the factory committee may be called to take up the matter. He has already conferred with W. H. Wiley, secretary of the Commercial Club.

Portland, Me.—The Hyde Park Rubber Co. has been organized to deal in rubber goods. James E. Norton is president; Daniel E. Barry, Medford, Mass.; Charles H. Poor, H. C. Welsh, Austin E. Ruddick, Frank R. Marritt, Haverhill, Mass., and Harry L. Cram, Portland, Me., incorporators.

Gainesville, Fla.—The Gainesville Automobile Co. has been founded by Mr. Lilienblum, of New York, to manufacture, sell and repair automobiles, motor boats, marine and stationary engines. The company has already leased premises opposite the postoffice, and intends to extend the factory by building the first steel structure in the city.

RECENT INCORPORATIONS

New York—Michelin Tire Repair Works, capital stock \$10,000, to engage in the buying, selling, repairing, importing, exporting and marketing generally, either by wholesale or retail, of bicycle and automobile tires of all kinds. Incorporators, R. L. Eaton, A. J. de Raismes and H. D. Wolfskiel.

New Haven, Conn.—Connecticut Automobile Co., capital stock \$5,500. Officers are as follows: President, Thomas M. Whitfield; treasurer, Jeremiah C. Smith; secretary, David E. Fitzgerald.

Dayton, O.—Dayton Automobile Co., capital stock \$25,000, to manufacture and deal in automobiles. Incorporators, A. M. Dodds, J. L. Baker, E. E. Burkhardt, N. A. Tressler and John N. Vandeman.

Montclair, N. J.—De Voll Tire Co., capital stock \$250,000, to manufacture tires for automobiles, bicycles, etc. Incorporators, C. H. De Voll, of New York city; H. S. Howland, of Montclair; John J. Halloran, of Flushing, N. Y.

New York—Crawford-Bradley Co., capital stock \$45,000; to maintain a garage and automobile livery. Incorporators, Wm. Crawford, Frank Bradley and H. J. Crawford.

Elizabeth, N. J.—Elizabeth Motor & Cycle Co., capital stock \$2,000; to deal in bicycles, motor cycles, automobiles. Incorporators, Mortimer S. Ross, James S. Henderson and Ada H. Foote, all of Elizabeth.

Trenton, N. J.—Trenton Auto & Supply Co., capital stock \$10,000; to deal in automobiles, sporting goods, etc. Incorporators, John F., Jeremiah P. and Mary M. Toman, all of Trenton.

Brooklyn—Keystone Automobile & Garage Co., capital stock \$20,000; to manufacture and sell automobiles and machinery. Incorporator, Holmes M. Harwood.



DRIVING A MOTOR CAR - THE MOTOR AS A BRAKE

TO BRAKE is to produce heat and elevate the temperature of the bodies on which the friction exerts itself. Heat is unavoidable, as it is some of the energy or work that we draw from the car in motion and which accumulates itself, in the present case, under a particular form. That heat is extremely prejudicial to the bodies it attains. When the action of a brake is prolonged without interruption for several minutes the drum reaches a temperature close to that of "dark red." The bands of camel hair or ordinary leather with which they fitted the collars formerly were quickly reduced into coal; the bands of bronze with which they are fitted nowadays, riveted on the jaws, get soft, deformed and fritter away in little pieces. They have improved that state of affairs to a great extent by providing the car with several brakes, and the driver is not excusable when he burns them, even in the course of a long descent, as he only asks a slight effort of each of them. I shall add, however, that the remedy is not in the least radical and that down grades of 10 or 20 miles, as can be encountered in mountainous countries, will put the whole series of brakes close to ruin if the sensible driver does not use his natural brake, the motor.

The natural brake of anything mechanically propelled is the motor. It is that organ that gives and draws off the movement. It is that organ that causes the speed to increase progressively or decrease progressively. Is it not the horse that pulls the carriage and also holds it back at the driver's will? Is it not the screw that propels the steamer and also brakes it by suddenly revolving in the opposite way? Is it not the wing that carries up the bird and also stops it over a twig? A thing in motion which cannot stop itself by means of its own motor has not, so to speak, any vitality—that is, it does not carry with itself the powers to which it owes its action, such as a bullet, a balloon, etc. It is logical to say, consequently, that in an automobile the best brake is the motor. I know I am destroying the principles of the beginners, principles that so-called experienced mechanicians have stupidly lodged in their heads. These competent advisers have told the young amateur driver that braking with the motor is bad. They have told him, among other things, that when going down hill the use of the motor as a brake is very prejudicial to the cross-heads and piston rods! I would like very much to know what is, for the cross-head, the more prejudicial in these two instances—to give action to the car, even on the flat, and receive for so doing explosive blows, sometimes attaining a pressure of 30 pounds

to the cubic inch, or simply retain the car by employing the slow motion of a dead engine?

Of course, I am ready to recognize that the inoffensive braking of the motor is not always applicable, particularly when quick braking, or braking to a standstill, is needed. The gasoline motor, unfortunately, does not possess as yet a sufficient suppleness to stop the car within a few yards like a good steam motor—a Serpollet or White, for instance. The sudden cessation of the admission in a gasoline motor should, as a rule, precede the careful brake stroke in cases where an immediate stop is not urgently needed. The motor is, above all, a factor of resistance to acceleration and, consequently, one can employ it intelligently on mountain roads or any long descent. But our motors are not exactly established in view of such a logical work. The explosion chambers remain hermetically closed when they should be opened on the atmosphere at the time the car wants to be held back. Let us suppose that the cylinder heads are closed. So are they, in fact. The driver shuts off the gas. What happens? The pistons, going down, create a depression in the explosion chambers, this resulting in an ascent of the oil, which greases the plugs or the inflamers and will burn as soon as the explosions start again. The second result is evidently to retard the car when going down hill. Immediately after the strangling of gas the motor must find some power to action its pistons, for its short momentum has ceased. The weight of the car supplies that power to the motor, but the principal motion that causes the car to be held back going down hill is the depression above described, which at the same time is a help to the ascending of the piston and an obstacle to its descending. Inversely, if the driver only cuts the current and keeps the throttle wide open he will, for the retarding gait of his car, profit by the work of decompression accomplished by the ascending piston. I shall not insist in the last instance on the wasting of gas resulting on the full admission; there would be advantage in that moment to open a wicket of pure air.

* * *

In all cases, without any modification to the actual dispositions in motoring, one can and must use the motor to hold the car on a long slope. The driver will place his speed lever on the lowest gear if the declivity is long and steep; for instance, to descend on an 8 per cent grade for half a mile he will take the second, or 10 per

cent the first and on 3 per cent the third. He will cut off the gas and circuit and let the car go. If the speed threatens to increase rapidly, pass on to the second if you are on the third, and so on. If the acceleration comes but slowly, you will avoid danger by braking lightly from time to time with the hand or the foot, but so that neither pedal nor lever will disengage the clutch. I would advise getting rid of any apparatus allowing the hand brake to disengage the clutch; it is an inconvenience.

I have said above that the explosion chambers, instead of remaining hermetically closed during the turning to account of the motor as a braking agent, should, on the contrary, be opened on the atmosphere—in fact, they should be fitted with a cock through which, playing thus the role of pumps, the explosion chambers would aspire and then force back the air. The orifices of those cocks should be calculated so that the aspiration offers some resistance and the blowing back a similar difficulty. This means that the diameter of those orifices would necessarily vary according to the dimensions of the cylinders, which is not altogether of a difficult application. One would obtain by this process a real work of the motor during the entire length of the strokes of the pistons, a work that would be supplied at the expense of the energy stored, so to speak, in the car, or to say, better still, at the expense of that car itself. What is more, that system would avoid the depression in the cylinders which drives the oil to the head of the motor. It would at the same time cool the cylinders in the descents with a fresh air irrigation.

Brake application too often degenerates into a quick thrust on the brake pedal with accompanying release of the clutch, and quick stop, much to the impairment of the tires, or a hasty pull or push of the emergency brake lever accompanied by similar results. Such is the amateur program for emergencies, and frequently in making curbside stops action nearly as radical takes place. This unnecessary strain can be eliminated by using the motor as a brake, as outlined above. In this country so little touring is done in real mountainous districts that the braking aspect of the motor has not received its due attention. The Glidden tour set the ball rolling, and the way in which brake bands and brake shoes wore out, when in real service, was sufficient to start the most conservative guessing. Germany and France, as well as seagirt England, have advanced well in motor braking. This is natural. With them mountains and hills abound in the finest touring regions, and the drivers have studied the problem.

American Motor League Official Bulletin

National Headquarters, Vanderbilt Building, New York

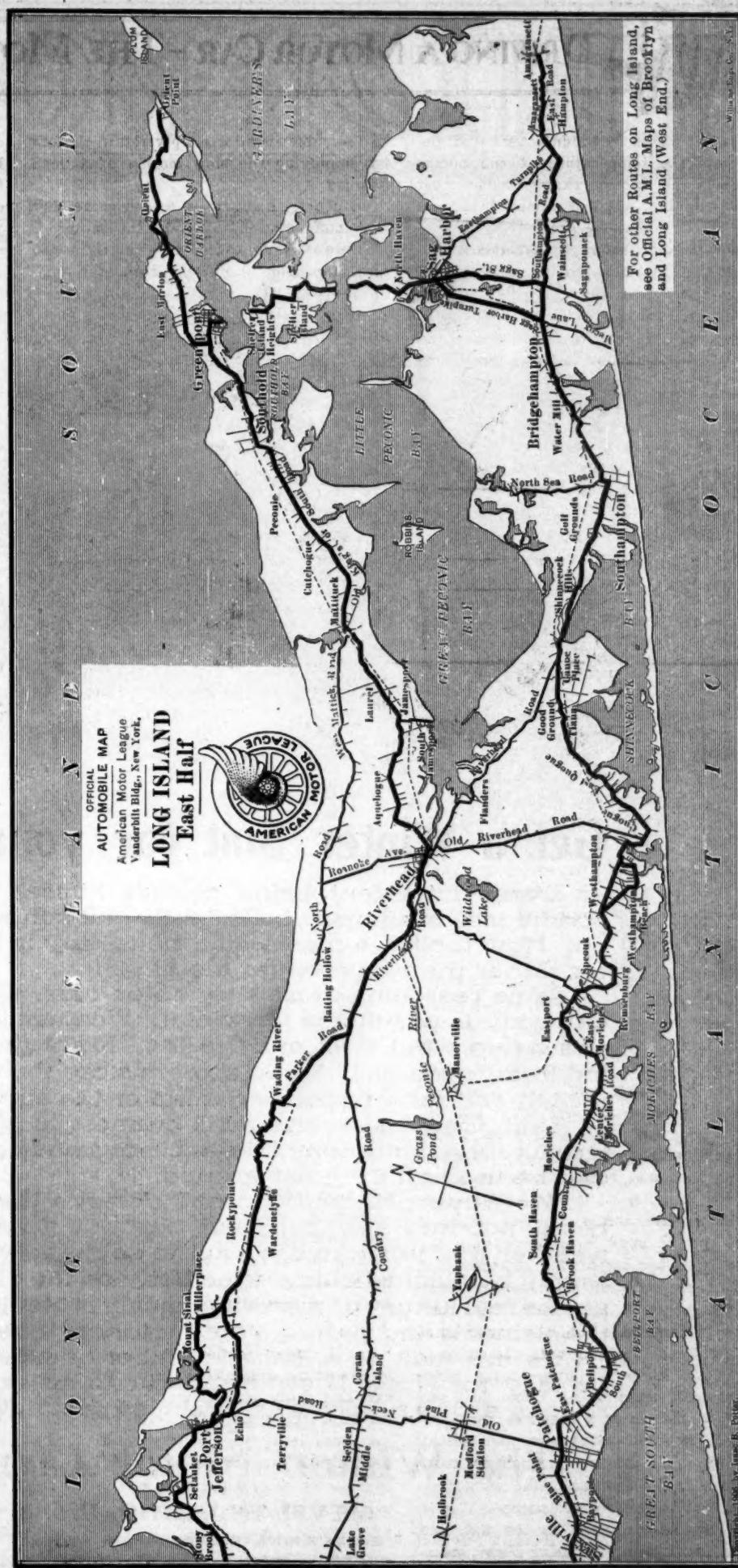
MAP OF ROUTE LONG ISLAND— EAST HALF

Last week our official map showed the best motoring routes on Long Island running from New York eastward for about 50 miles and just beyond Sayville. There are four important outlets from Manhattan eastward, being the Astoria ferry from Ninety-second street, connecting with Flushing avenue; the Long Island railroad ferry from Thirty-fourth street, connecting with Jackson avenue and Thompson avenue; the Williamsburgh bridge, and the Brooklyn bridge. From these points there are separate lines of main highway running eastward for about 28 miles, but beyond Jericho and Farmingdale the two center-island routes lost much of their importance and quality, the main motoring routes being along the north and south shores from these points to the easterly end of the island. These north and south routes are connected at different points by roads of fair quality, but it is not generally known that the cross-island route from Islip northward, via Carlton avenue, Central Islip, Hauppauge and Smithtown Branch, is generally to be preferred to any of the others.

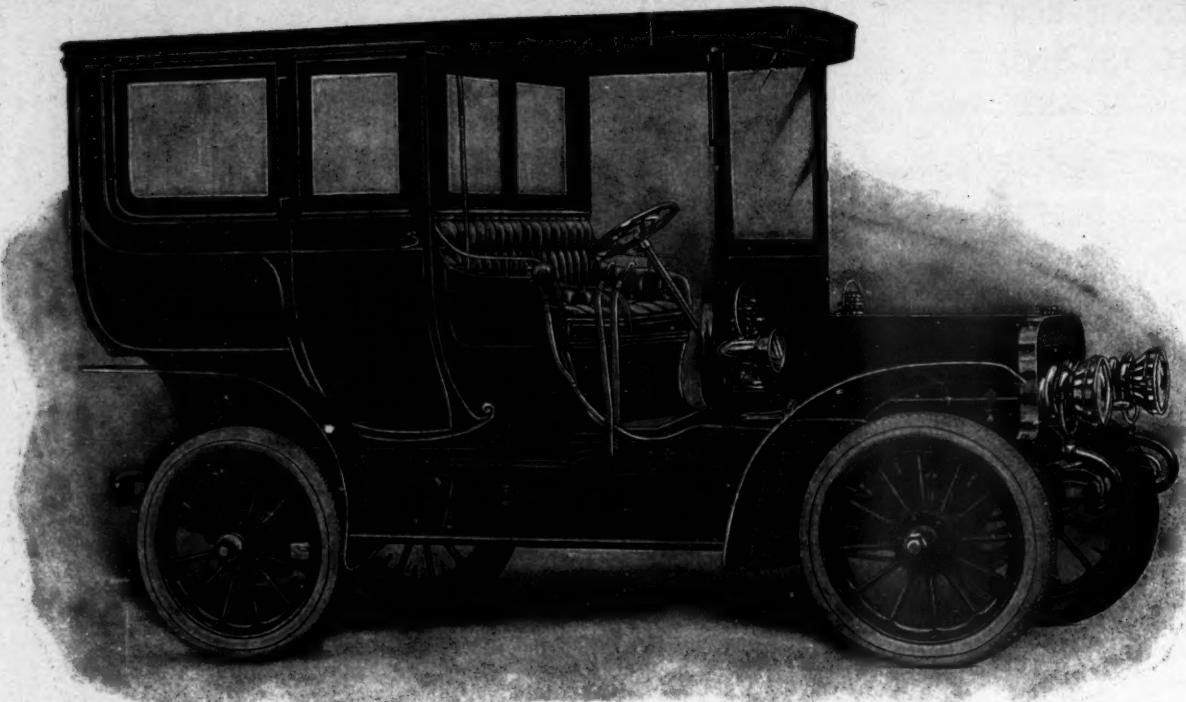
The official map this week shows both the northerly and southerly routes from Stony Brook and Sayville to Orient Point and Amagansett respectively. The cross routes from Greenport to Sag Harbor, Bridgehampton and Southampton, and from Riverhead to Quogue, are also shown as well as the less used cross route from Patchogue to Port Jefferson. The line shown in the map from Speonk to Riverhead is a cycle path and will be so indicated in the official road book.

FREE TO A. M. L. MEMBERS

This map and all others will be printed in the official A. M. L. route book and a copy will be given free to each member of the league. Meanwhile these maps will be printed on substantial cards for the convenient use of members and ten of these cards will be given free to each member. League membership is open to all motorists of good character. There is no initiation fee; dues \$2 a year; full printed particulars on request. Addressing the American Motor League, Vanderbilt building, New York, will bring full and complete information concerning this organization.



WINTON MODEL-K



Get a Winter Suit for your Model K

Every intelligent being clothes himself to suit weather conditions. In summer, he is lightly clad. In winter, he bundles up. How foolish a man would be to stay in the house all winter rather than buy winter clothing.

Same reasoning applies to motor cars. The open touring car body is unsuitable for winter. Weather too cold, too much snow, rain, wind, sleet, and the like. Might get pneumonia riding in an open car. Some owners store their automobiles all winter, and take to pedestrianism or the street cars.

That doesn't look like good business judgment. Get a winter suit for your automobile—a Limousine Body—and your car can be used all the year around.

The Winton Model K doesn't deserve the ill treatment of being put into storage. That car will go anywhere in any weather, and you can use it in the coldest weather that blows simply by placing a Limousine Body on the chassis. Thus you get the real luxury of motoring, snugly protecting yourself from the elements and making your motor car investment profitable.

We are making a limited number of Limousine Bodies especially for Model K owners, and can make prompt delivery so long as the supply lasts. Detailed description upon request.

The Winton Motor Carriage Co.

Member A.L.A.M.

CLEVELAND, OHIO, U. S. A.

Branch Houses in New York, Boston, Philadelphia, Pittsburg, Chicago and London. Winton Sales Agencies Everywhere.